

USE IT OR LOSE IT

Music preferences and uses related to psychosocial functioning among adolescents and young adults

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Music preferences and uses related to psychosocial
functioning among adolescents and young adults

Gebruik het of verlies het

Muziekvoorkeuren en gebruiksvormen gerelateerd aan het psychosociale
functioneren onder adolescenten en jongvolwassenen

(met een samenvatting in het Nederlands)

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GENERAL INTRODUCTION

Introduction

“Music corrupts the minds of our young”. This allegation has generated numerous studies analysing ‘music taste’ and the psychosocial functioning of the young audience of popular music. Young people are especially considered to be susceptible to messages promoting sexual promiscuity, substance use, violence, and sometimes even suicide. The most notorious music genres in this regard are rap/ hip hop, and harder forms of rock such as heavy metal and punk. This thesis focuses on the behaviour correlates of different music tastes among adolescents and young adults (twelve to twenty-nine year olds). This study simultaneously assesses relevant factors other than music taste. In addition, the ‘positive effects’ of music on listeners is studied, particularly in the way music relates to emotional functioning. Finally, the nature of ‘music taste’ is reassessed through survey studies and analysis of the consistency of music preferences over time.

Popular music is relevant to the psychosocial functioning of adolescents and young adults for a number of reasons. First, themes in popular music’s lyrics and videos relate to adolescent developmental themes, such as romance, sexuality and identity issues (Dukes, Bisel, Borega, Lobato & Owens, 2003; Greeson & Williams, 1986; Schwartz & Fouts, 2003; Ter Bogt, 1997; Ter Bogt, Bogers, Kloosterman & Engels, *submitted*).

Second, music preferences carry social connotations, which are used in appraisals of others (Knobloch, Vorderer & Zillmann, 2000; Rentfrow & Gosling, 2006; Selfhout, Branje, Ter Bogt & Meeus, 2007), and in defining and showcasing one’s own identity (North, Hargreaves & O’Neill, 2000). Frith (1981) astutely called this the “badge” function of music, i.e. music is never socially inconsequential. Thereby, music preferences and involvement with music are useful tools in accomplishing the main developmental task of adolescence (Erikson, 1968), that is, identity construction.

Third, for most adolescents, the onset of puberty requires increased skills for mood management. Music has powerful ‘affective’ determinants on listeners (Juslin & Laukka, 2004). The relevance of music manifests itself in the behaviour of young adults, such as the commonly observed increase of time and money invested in music after the onset of adolescence (Christenson & Roberts, 1998).

Popular music contains numerous genres. During adolescence, knowledge of this rich and varied field of popular music is still developing (Christenson & Roberts, 1998). At an early age, however, most youngsters already are capable of expressing their evaluations and

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commitments to this diversity. For them music taste is a heterogeneous concept, exceeding the simple opposition between pop music and the rest (Ter Bogt, Raaijmakers, Vollebergh, Van Wel & Sikkema, 2003).

In this study, music taste is defined as a multi-layered phenomenon, acknowledging the complexities of the music field (see figure 1). At the first level, music is categorised into genres, such as rap/hip-hop, rock, hardrock, dance, or soul. At the second level, related genres are modelled together as indicators of latent constructs, which are called styles (Ter Bogt, Raaijmakers et al., 2003). The ‘relatedness of genres’ as correlated among listeners, has been analysed using techniques such as multi-dimensional scaling and factor analysis. Consistent cross-referenced styles have included: an easy to listen to, easily accessible Pop style, such as can be found in the charts; an Afro-American influenced style (e.g. soul, r&b, rap/hip hop); guitar-driven Rock (containing genres such as hardrock & punk); electronic Dance (comprising genres such as trance, techno); and ‘serious’ music (e.g. classical music and jazz) (Christenson & Peterson, 1988; Delsing, Ter Bogt, Engels & Meeus, *in press*; Rentfrow & Gosling, 2003; Roe, 1985; Stevens, 2001; Tillekens, 1993).

Four, the most comprehensive approach to music preferences is to analyse how groups of people cohere over mutual likes and dislikes, selecting from the wide diversity of music available (Ter Bogt, Raaijmakers et al., 2003). Genre preferences are interesting in the amount of information they provide. They give an overview of relative popularity of different types of music. However, in studying music taste, it is more informative to construct taste groups. Such groups consist of people with similar patterns of likes, dislikes or neutrality towards a range of music genres. Few people are exclusive in their music taste to the extent that they will only appreciate one type of music, e.g. exclusively hardcore-techno music. The taste group approach explicitly recognizes the complexity of taste (Denisoff & Levine, 1972; Fink, 1985; Fox & Wince, 1975; Gans, 1999; Mulder, Ter Bogt, Raaijmakers & Vollebergh, 2007; Ter Bogt, Raaijmakers et al., 2003). Figure 1 displays the multi-layered approach to music taste in this thesis.

Different types of music represent different symbolic environments into which adolescents immerse themselves (Christenson & Roberts, 1998; Frith, 1996). These symbolic differences are used to explain the associations between music tastes and problem behaviours, such as aggression and substance use. For instance, studies have compared songs and videos

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Figure 1

The multi-layered approach to music taste in this thesis; from genres to styles to taste groups

Levels:				
Genres	chart-based	rap/hip hop	punk/ hardcore/ grunge and rock	classical music
	house/ trance/ techno	soul/ R&B	gothic	jazz
	club/ mellow	reggae	heavy metal	
Styles	Pop-Dance	Urban	Rock	“Serious” music
Taste groups (% of total N):				
1. Middle of the Road (18.1)	+/-	-	-	-
2. Urban (20.2)	+/-	++	-	+/-
3. Exclusive Rock (1.9)	--	--	++	--
4. Rock-pop (32.4)	+	+/-	+	-
5. Elitist (7.5)	-	-	-	+
6. Omnivores (13.9)	++	++	+	++
7. Low Involved (6)				

Note: Taken from Study 4.

from different genres in terms of referrals to aggression and substance use. A preference for heavy metal and rap/hip hop has been found to be positively associated with substance use (Arnett, 1991; Miranda & Claes, 2004). At the same time, songs and videos from this genre made more frequent referrals to substance use than other genres (Diamond, Bermudez & Schensul, 2006; Gruber, Thau, Hill, Fisher & Grube, 2005; Miranda & Claes, 2004; Roberts, Christenson, Henriksen & Bandy, 2002; Roberts, Henriksen & Christenson, 1999). In addition, music videos have been ‘content analysed’ following concern over possible overexposure of sexual and violent content (see, e.g., Johnson, Adams & Ashburn, 1995; Johnson, Jackson & Gatto, 1995; Tapper, Thorson & Black, 1994; Wingood et al., 2003). A higher level of referrals to such content in certain genres is then used to explain positive associations between preference for these genres and substance use, sexual risk-taking and violent behaviours (Hansen, 1989, 1995; Hansen & Hansen, 1990a, 1990b, 1991).

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This thesis

The five studies in this thesis will tackle unanswered questions regarding the role of music taste in the psychosocial functioning of adolescents and young adults. For the first time, we were able to measure intra-individual consistency of music taste over time. In addition, we applied the taste group approach to adolescent music preferences and compared groups in terms of problem behaviours. Two studies focused on the associations between music preferences and substance use. One provided an overview of the associations, controlling important factors otherwise related to substance use. The other modelled a mechanism possibly explaining the association between music taste-substance use, incorporating the role of substance use behaviours of peers. Finally, recognizing the diversity of the popular music audience, a typology of music listeners was constructed based on differing patterns of music involvement and use. These groups were then compared in terms of music taste and emotional correlates.

As mentioned before, many studies in this field have been focused on relating music tastes to problem behaviours. In the literature on this subject, a distinction is routinely made between ‘internalising’ and ‘externalising’ problems. Internalising problems concern somatic complaints, symptoms of anxiety and depression, and withdrawal behaviours. Externalising problems comprise aggressive and delinquent behaviours, and substance abuse (Achenbach, 1991). This distinction will return throughout this thesis.

Though focusing on adolescence, we extend our research above the upper limit of this life phase, as the ages of the participants included in our studies range between twelve and twenty- nine years. This age range includes adolescence (ages 12 to 18 years) and young, or emerging adulthood (see e.g., Arnett, 2000) (ages 19 through 29 years, in this thesis). Popular music is important to most adolescents (Frith, 1981; Ter Bogt, 2004a, 2004b) and this extends into adulthood as well.

Young adults were included in two of the five studies in this thesis. These two studies were aimed at assessing the consistency of music preference ratings over a 21 month period, and related music uses to emotional measures, including internalising distress. The findings underlined the continued importance of music listening after adolescence. Still, three of the five studies in this thesis assess the associations between music preferences and psychosocial

functioning among adolescents only, and therefore, the theoretical framework used will mostly refer to adolescents.

Theories on the role of pop music in psychosocial functioning

The theoretical framework within which the findings of the studies in this thesis are placed is the interactionist Uses and Effects Theory (Rosengren & Windahl, 1989), which is related to Cultivation Theory (Gerbner, 1998). Central to the Uses and Effects Theory is the process of socialisation, which helps explain what influences adolescent development in terms of attitudes and values transmitted by ‘important others’ associated with the adolescent. Uses and Effects combine the insights from Media Effect theories, American Uses and Gratifications tradition, and British Subcultural theory. First, a brief summary of the Media Effect theories, American Uses and Gratifications tradition, British Subcultural theory and Cultivation theory will be given, followed by Interactionist theories regarding popular music and adolescents specifically, i.e. Roe’s Media Delinquency theory and Arnett’s Self-Socialisation theory.

Media Effect theories study the mass media as an influence on people’s thoughts, beliefs, emotions, and behaviours (e.g., Giles, 2003). In this interpretation, listening to music with a violent content will cause listeners to behave violently. The mechanism through which this takes place is social learning, involving copying of behaviour and priming. Short-term priming effects can take place during watching music videos, or listening to songs’ lyrics. Priming refers to the facilitation of cognitive access to categories by viewing, or hearing related categories. For instance, hearing words related to violence, when coupled with positive affect while hearing the song, can make related cognitive categories become more easily accessed. Repeated exposure, then, could make social categories chronically accessible. This in turn might make acceptable behaviours and attitudes that would otherwise be socially unacceptable. Thus, media content is believed to have psychological effects in line with the nature of the content.

The American Uses and Gratifications tradition considers media consumption – which includes music consumption - from the point of view that people use mass media, to derive gratification. Individuals chose which media to consume, and chose what to do with it. People differ in the needs that media gratify. For instance, media can gratify needs for information or

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entertainment. Such studies focusing on popular music, have looked at the desires that music listening fulfils. This approach emphasizes the volition of music listeners in their choices rather than music exerting its effects on listeners against their active participation. Any effects that do take place, requires taking into account individual differences and environmental factors.

The British sociologists (from the Birmingham Centre for Contemporary Cultural Studies (CCCS), University of Birmingham) offered their own theory on how and why music matters. These sociologists also approached the popular music phenomenon as valuable to people. They used the notion of subcultures (Hebdige, 1979), and showed how working class males used their choice of music (e.g. punk), leisure and appearance as a means to cope with their social class and position. Their defiant music preference helped signify a personal identity, space and place (the street-corner).

This type of study of specific youth cultures centred on music has been applied to other taste cultures. For instance, the heavy metal subculture (Weinstein, 1991/2000), and the dance underground (Thornton, 1996) also constitute cultural forms more or less expressing contemporary “resistance through rituals” (Hall & Jefferson, 1976).

Cultivation Theory (Gerbner, 1998) states that media helps shape our understanding of the world, while acknowledging the importance of the existing social and cultural context in which media are consumed and the consumers are living (Giles, 2003). As Gerbner emphasized: “Cultivation Analysis is not a substitute for but a complement to traditional approaches to media effects” (p. 191, Gerbner, 1998). The mechanism of cultivation posits that the acquisition of knowledge, attitudes, and values will occur (Ward, 2003), provided that exposure to consistent and coherent content is repetitive and long-range (Gerbner, 1998). Thus, Cultivation Theory considers media effects in terms of a diffuse and prolonged process, acknowledging the simultaneous influences of family, school, and peers. In this view, music is part of our cultural symbolic environment and communicates, as well as propagates, attitudes and norms.

Closely related to the cultivation mechanism is the concept of Socialisation (Rosengren & Windahl, 1989). This refers to the process wherein parents, school, peers and media function as agents representing attitudes and values influencing the developing adolescent. Media and peers are the socialising agents over which adolescents have the most control, and over which

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parents worry most. The following described processes explain the way in which the findings of this thesis concerning music taste can be connected to behavioural questions.

Three processes make up socialisation: 1) modelling of desired behaviour, 2) reinforcement of personal values and 3) social interaction (Rosengren & Windahl, 1989). Artists and their music, their lyrics, and their personal lives as exposed in the press, are suggestive models for the teenagers. Modelling may encourage expressions of sensation-seeking and egocentrism, which are already teenage developmental predispositions (Arnett, 1992b). This modelling increases the likelihood of dangerous behaviours, such as taking health risks and delinquency.

Social interaction refers to the context within which behaviour takes place. The context can be of an organized nature as opposed to a spontaneous nature; and it may concern activities with parents versus peers (Rosengren & Windahl, 1989; Steinberg & Silverberg, 1986). Popular music has different socialising functions, depending on the social interaction context. The next section describes theories on the role of popular music in the development of adolescents, based on Socialisation theory.

Theories on the role of popular music in the development of adolescents

Jeffrey Arnett and Keith Roe formulated theoretical views explaining the associations between music taste and psychosocial functioning of adolescents. Arnett's self-socialisation view on the relationship between music listening and adolescent functioning combines insights from the Uses and Gratifications tradition with developmental perspectives on adolescence (Arnett, 1992a, 1992b; Arnett, 1995, 1996; Arnett, Larson & Offer, 1995). Arnett argues that the extent to which developmental predispositions occur depends on the socialisation of children and adolescents. The dispositional traits 'egotism' and 'sensation seeking' are particularly relevant in explaining adolescent reckless behaviour. The manifested severity of these traits depends on the socialisation context within which individuals develop. This context encompasses peers, siblings, parents, extended family, the neighbourhood, the school system, the society at large and the cultural belief system. Popular music fits into this framework as part of the socialisation context that interacts with predispositions, and the other socialising agents.

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The median norm of safe behaviour is conventionally called the main-stream. Socializing agents interacting with developmental predispositions may tempt behaviour away from the conventional. For instance, perceived low status within school and a negative attitude to school (independent of socio-economic background) can lead to a stronger orientation to peers for an alternative sense of status. Media content is sought to reinforce this marginal position and provide support and a sense of belonging (Frith, 1981; Roe, 1992). Roe captured this developmental trajectory in a paper he entitled “Towards a Theory of Media Delinquency” (1995). At the heart of this syndrome lies the potential of music to boost self esteem, and to boost a sense of internal locus of control; through control over media content, and (self-) control over moods and atmosphere. This can occur even when adults condemn this detrimental type of socialisation agent.

The ability to measure the association between music taste, preference and effects with psychosocial functioning is an unresolved and ongoing data-set. This matrix of associations undoubtedly arises due to an interaction between selection and influence. The studies in this thesis provide cross-sectional overviews of con-current relationships, and did not explicitly test theoretical assumptions. However, the ‘Interactionist’ view is the most comprehensive theory explaining the relevance of music taste in psychosocial functioning. In general, music is considered an integral part of the youth world : it is considered “equipment for living” (Christenson & Roberts, 1998).

Rationale behind and description of the studies in this dissertation

The studies in this thesis were conducted for a number of reasons. The first objective was to examine a central, basic issue in the study of music taste not previously considered. We aimed to measure the consistency over time of individual preference ratings regarding different music genres and favourite artist listings.

Second, the studies were conducted to reassess the relationship between music taste and problem behaviours on the scale of national, epidemiological research programs, which to date had been lacking in the literature. Previous studies had been conducted among more limited samples, mostly in English-speaking countries.

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The scale of the research programs offered two important advantages to supplement the literature on music taste and psychosocial functioning. That is, although interesting patterns have emerged from the literature linking music preferences to behavioural outcomes, these studies have generally collapsed music preferences into simple dichotomies such as Pop versus Rock, or Mainstream versus Deviant. This does not do justice to the distribution of music tastes among adolescents. Three of our studies were part of epidemiological research programs, enabling the assessment of preference ratings of a wide range of music genres.

The size of the samples used in this thesis (between four and seven thousand pupils) also allowed for the controlling of a number of relevant confounders, or covariates, such as social support from parents and friends, and perceived school functioning. This size enabled our tests to measure possible unique correlations between music taste and problem behaviours, separating this issue from other characteristics of youth.

A third objective was to augment the literature on the link between music taste and substance use. We modelled a mechanism potentially underlying this link. Both music preference and substance use behaviours are shared among friends. Therefore, we aimed to answer the question whether or not music taste is mediated by peer substance use in explaining adolescent substance use. That is, the relevance of music preference to self-reported substance use may be spurious when music preference is also linked to perceived peer use. Perceived peer use in turn strongly relates to self-reported substance use, as use or abstinence is often shared among friends. Should music preference prove spurious, this would provide support for the socially binding nature of music taste, instead of a more individualistic nature.

The fourth objective of this thesis was to use the Typological approach to study music taste and uses of music, which to date had been lacking in the literature as well. The Typological approach consists of grouping listeners based on patterns of characteristic music tastes, or uses. As such, it combines two research methods: the ‘case-centred’ and the ‘variable-centred’ approach (Mandara, 2003). The former recognizes the complexity of psychosocial realities at the level of the individual, and therefore does not venture into testing the role of factors across populations, as this would overlook individual differences.

Conversely, the variable-centred approach consists of analysing the associations between factors and outcome measures across populations to ensure that findings can be generalised. The Typological approach seeks to find groups of individuals with similar

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configurations of variables (Cairns, Cairns, Rodkin & Xie, 1998). Thereby, individual differences are recognized, without limiting findings to single individuals. In other words, the grouping of sufficient numbers of respondents ensures ‘generalisation’, while recognizing the existence of differing configurations in a population ensures sensitivity to individual differences.

With respect to music taste, groups were formed based on similar patterns of likes, dislikes and neutrality regarding a wide range of music genres (see §1, table 1). The objective was to approach music taste in a more holistic way than in terms of linear associations between a number of genre preferences and problem behaviours. Instead, taste groups were compared in terms of problem behaviours. In another study a typology of the music audience was constructed based on involvement with music and four types of music use. We then compared music listener groups in terms of daily time spent listening, music taste, levels of internalising problems and emotions during listening.

The five studies have either been published as individual articles or have been submitted for publication. Being self-contained, each study has its own abstract, introduction, discussion and reference list.

Study 1. From Death Metal to R&B? Consistency of music preferences among Dutch adolescents and young adults

Previous studies of musical taste have been cross-sectional in nature, providing frozen snapshots of a certain group at a certain time-point. How that taste develops within individuals, has not yet been extensively studied. This is the first study ever using a longitudinal design assessing intra-individual consistency of music preferences in terms of favourite artists and genre ratings (Mulder, Ter Bogt, Raaijmakers, Nic Gabhainn & Sikkema, *in press*). This study extends the existing literature to a wider age range. It is concerned with the consistency of musical taste within individuals and includes three separate conceptualizations of musical taste: artists, genres and styles. An internet-panel of 236 Dutch adolescents and young adults (aged 12-29 years) was followed during a period of twenty-one months (between 2004 and 2006). Their music preference ratings at three points in time were analysed in terms of ‘ipsative’ stability, using the q -correlation technique.

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Study 2. The soundtrack of substance use: music preference and adolescent smoking and drinking

Researchers examining the link between music taste and substance use have compared fans of extreme non-mainstream music to mainstream listeners. This dichotomy does not do justice to the entire pop music audience. Moreover, previous studies lacked data on a national level, and were mostly conducted in English-speaking countries. Conversely, in this study the music preferences are represented regarding a wide range of genres and the study is representative at the national level of a non-English speaking country (Mulder et al., *in press*). In addition, factors important in both music preference and substance use, such as school level, school achievement, social support, and perceived parental and peer substance use were available. The 2003 Dutch National School Survey on Substance Use (DNSSSU) was conducted among 7,324 participating, school-going adolescents. Logistic regression analyses were conducted on 'last month' tobacco and alcohol use. In addition, separate analyses were run for gender groups, because males and females differ in types of music preferred, as well as in substance use behaviours.

Study 3. Is it the music? Peer use mediates the link between music preferences and adolescent substance use

This study modelled the concurrent relationships between music preferences, self-reported substance use and perceived peers' substance use (article under review). Factor analyses showed that preferences for eight music genres could be structured into four styles: Pop (chart music, Dutch pop), Adult (classical music, jazz), Urban (rap/hiphop, soul/R&B) and Hard (punk/hardcore, techno/hardhouse); substance use is indicated by smoking, drinking, and cannabis use. Structural equation modelling is used on the same data as in the previous study. This technique enabled simultaneous testing of relationships. That is, apart from the explanation of self-reported substance use by preference ratings of different types of music and perceived peers' use, the associations between the latter two are taken into account, as well as those between self-reported and perceived peers' use.

Study 4. Music taste groups and problem behaviour

Most studies of the relationships between music preference and psychosocial functioning have focused on non-mainstream music with a poor public reputation – mainly heavy metal and hip hop. The basic approach has been to compare problem behaviour scores of adolescents with a preference for these ‘deviant’ music styles to the scores of adolescents who like ‘mainstream’, i.e., socially accepted music. This stemmed from small samples of adolescents, which also led to a ‘representation’ covering one geographical area only. In this study (Mulder et al., 2007) we approached music taste in terms of an elaborate judgment of genres in terms of likes and dislikes, or neutrality. That is, we constructed taste groups, based on liking ratings regarding a wide range of genres. As part of the WHO Health Behaviour of School-Aged Children (HBSC) study (Ter Bogt, Van Dorsselaer & Vollebergh, 2003), 4194 adolescents aged 12 to 16, and representative of the Netherlands, completed questionnaires assessing socio-demographic profile, (dis) liking of a representative range of music genres, and social-psychological functioning by means of the Youth-Self Report (Achenbach, 1991). Hierarchical cluster analysis was used to construct music taste groups. Next, a MANOVA was employed to test for differences between taste groups in terms of psychosocial problem behaviours, while controlling for relevant personal and background characteristics.

Study 5. Thank you for the music! A typology of music users and their characteristics in terms of music taste, emotions during listening and level of internalising problems

Studies two through four linked music preferences to problem behaviours, without any information on what music means to the respondents, and the uses to which music was applied. This study was conducted to fill that gap, as well as the gap in the extant literature on music uses. That is, the Typological approach had not been conducted before on music listeners in terms of uses of music. In addition, this study added to the literature by emphasizing the differences in music listener groups in terms of music tastes and emotional correlates. Data was derived from 997 Dutch respondents aged 12 to 29 years who filled in questionnaires on the internet. Using Latent Class Analysis, a typology based on differential patterns of music uses was constructed. Next, based on two MANOVA analyses, the music use groups were characterised in terms of daily time spent listening, music preferences, level of internalising distress, and emotions during listening.

General discussion

Finally, in the general discussion we analyze the main findings from these studies in connection to the original aims. In addition, the theoretical and practical implications of the studies will be discussed, as well as limitations of the present studies and subsequent directions for future research.

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STUDY 1

From death metal to R&B? Consistency of music preferences among Dutch adolescents and young adults

Based on: Mulder, J., Ter Bogt, T.F.M., Raaijmakers, Q.A.W., & Nic Gabhainn, S. (*in press*). From death metal to R&B? Consistency of music preferences among Dutch adolescents and young adults. *Psychology of Music*.

Abstract

The structure of music preferences has been investigated extensively. However, development of music preferences in terms of consistency of music taste is as yet understudied. In this study, intra-individual consistency of music taste was assessed among Dutch adolescents and young adults over three points in time in a 21 months period. An internet-based panel of 236 participants was asked to list their top 3 favourite artists or bands, and to rate their preferences for a range of music genres. Genre ratings were subsequently grouped into 5 styles, that is, Pop, Urban, Elite, Rock and Dance, using Factor Analysis. Thus there were 3 measures of music taste for each participant over time; favourite artists, preference for musical genres and for musical styles. Findings indicated that favourite artists tended to have a high turnover rate, that genres were rated relatively consistently with moderate to high q -correlations (between 0.41 and 0.67), and that style preferences were highly consistent (q -correlations between 0.77 and 0.86). Differences in consistency over time across gender and educational level were not substantive, but age was positively related to music taste consistency. It is concluded that music taste is already well developed in early adolescence, and crystallizes further during late adolescence and early adulthood.

Introduction

The field of music that listeners can choose from is varied, complex, and subject to change. One of the main approaches to studying music taste has included classifying the wide array of artists and their genre labels, and structuring the music audience's preferences (Blacking, 1995; Christenson & Peterson, 1988; Denisoff & Levine, 1972; Farnsworth, 1969; 1958; Fox & Wince, 1975; Frith, 1983; Johnstone & Katz, 1957; Lewis, 1992; Tillekens, 1993; Tillekens & Mulder, 2005). Historical and cultural developments within the field of music have been well documented, but relatively little is known about the developmental trajectory of music preferences within individuals. As gender and educational level are important determinants of music preference (Christenson & Peterson, 1988; Frith, 1981; North & Hargreaves, 2007a), this study investigates intra-individual consistency of music taste of female and male adolescents and young adults with different educational levels over time.

The most comprehensive model of sources of variations in musical taste was outlined by LeBlanc (1980). The author distinguishes three levels. The first refers to factors important in music taste that are external to the listener, such as the properties of the music itself, but also media and the peer group. The second refers to individual characteristics such as personality, current affective state and cognitive processing capabilities. The third level represents the response of the listener to the music listened to. Of course, the levels influence each other. This model has not been tested empirically in its totality due to its complexity (Hargreaves, 1986), but parts of the three levels distinguished have been investigated.

Variations in music taste have been studied by analysing the underlying structure of genre preference ratings of large samples of respondents. Techniques such as factor analysis and multi-dimensional scaling have revealed replicable, underlying dimensions, labelled styles. Consistent styles have included guitar-driven Rock (containing genres such as hard rock & punk), electronic Dance (comprising genres such as trance, techno), Afro-American influenced style (e.g., soul, r&b, rap/hip hop), high(er)-culture style of music (e.g., classical music and jazz), and an easy to listen to, easily accessible Pop style, such as can be found in the Charts (Christenson & Peterson, 1988; Delsing et al., *in press*; Rentfrow & Gosling, 2003a; Roe, K., 1985; Stevens, 2001; Tillekens, 1993).

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Apart from the musicological qualifications of the various dimensions that make up the music field, research has also revealed social determinants of preference for genres and styles. These include such social characteristics as gender and educational level (Bryson, 1996; Christenson & Peterson, 1988; Denisoff & Levine, 1972; Eijck, 2001; Frith, 1983; Peterson, 1996; Stevens, 2001; Tillekens, 1993). Females tend to like more melodic, relatively softer genres, whereas males tend to prefer louder, more monotonous sounding genres (Christenson & Peterson, 1988; Frith, 1981; North & Hargreaves, 2007a). Social status, as assessed by social class or educational level, is also an important determinant of taste (Bourdieu, 1979; Bryson, 1996; Coulangeon & Lemel, 2007; Eijck, 2001; Gans, 1999; Hargreaves, 1986; North & Hargreaves, 2007b; Peterson, 1996). Musical taste has been linked to social-economic status and arguably functions as an in-group/out-group delineator (Gans, 1999; Mark, 1998; Peterson, 1996). Among school-going youth, social class is frequently operationalised in terms of educational level. Several investigations have demonstrated that having a higher educational level is associated with liking music such as jazz and classical music, and lower educational level to music such as heavy metal, disco, and country (Bryson, 1996; Roe, K., 1992; Tillekens, 1993).

Age

On the intra-personal level of LeBlanc's model (LeBlanc, 1980), maturation is conceived as being an important factor contributing to variations in musical taste. Thus the onset of adolescence is of particular relevance here. After its onset, more time and effort is invested in music, and knowledge of music types and their subgenres increases (Christenson & Roberts, 1998a). Music becomes a major medium of interest, as it enables consumption outside of the family context, where the television medium is more central (Steele & Brown, 1995). For 13 to 14 years olds, North, Hargreaves and O'Neill (2000) found listening to music was the most preferred indoor activity. As parents limit time spent with peers for most adolescents, listening in the private sphere enables parasocial contact with the peer culture and important figures within it (Giles & Maltby, 2004). Moreover, during the school-going period, knowledge of music functions as a status symbol (Brown & O'Leary, 1971). For some, this remains a lifelong struggle for peer recognition, as can be observed among music lovers of all ages (Frith,

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1996). Thus for the most part, knowledge of the artists and musical genres increases over the course of adolescence.

Three characteristic features of adolescent development are consistent with this heightened importance of music. The onset of puberty, that is, sexual-biological changes increases the desire for mood control (Rosengren & Windahl, 1989), and music is a powerful tool in mood management (Christenson & Roberts, 1998a; North et al., 2000; Sloboda & O'Neill, 2001a; Wells & Hakanen, 1991). Second, cognitive development during the course of adolescence enables appreciation of musical stimuli of increasing complexity (North & Hargreaves, 1997), allowing for changes in music preference, such as learning to appreciate jazz. Third, a developmental task specific to adolescence is developing a coherent sense of self (a self-concept), an ideal self, and a social self (Erikson, E. H., 1968; Tarrant, North & Hargreaves, 2002). Music is a powerful tool in resolving this task. It facilitates the choice of an identity, as well as its expression, and by enabling experimentation it serves as an imaginative platform on which to perform, construct and negotiate one's own identity, and situate oneself in the social world (DeNora, 2000; Hargreaves, Miell & MacDonald, 2002; Sloboda & O'Neill, 2001a). Conversely, music preferences also helps to identify others; that is, they aid social perceptions (Knobloch et al., 2000; Rentfrow & Gosling, 2006). These functions of music remain important over the lifecourse, but are of particular salience during adolescence (Tarrant et al., 2002).

Age-specific patterns in musical taste are reflected in the majority of adolescents liking what most others like. Popular hits are generally preferred by younger rather than older undergraduates (Fox & Wince, 1975; Mulder et al., 2007). A small proportion does not seem to be that interested in music, while another small proportion appears to prefer deviant forms of music. These patterns can be explained by the phenomenon of increased peer orientation during adolescence. From early adolescence on, peaking around the age of fifteen and sixteen, and subsequently declining, peers become more important in terms of values and ideas than parents and adult institutions (Steinberg & Silverberg, 1986). This helps explain why most adolescents report an increased preference for music most widely accepted by their peer group, that is, chart-based music. After the ages of fifteen or sixteen an increased individualization of music taste can be observed, with more room for idiosyncratic preferences.

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Previous studies of musical taste have been essentially cross-sectional in nature, providing frozen snapshots of a certain group at a certain time-point. How taste develops within individuals, has not yet been extensively studied. One exception is a study assessing retrospectively the age at which people develop lifelong song preferences. Using a convenience sample of one hundred Northeastern American consumers between the ages of 16 and 86, Holbrook and Schwindler (1996) asked participants to rate twenty-eight half-minute excerpts from songs that had represent styles that prevailed from the thirties to the eighties. Taking the participants' ages into account, they calculated the age at which the respondent had been or was at the time of the most liked song. The authors reported that the most liked songs originated from the year the respondent had been around 23.5 years old, which they concluded was the age around which music preferences crystallize or consolidate.

Longitudinal monitoring of music preferences has been reported twice. Rentfrow and Gossling (2003b) investigated the consistency of the factorial structure underlying music preferences of over 1,500 Texan university undergraduates, but the time-span covered was only three weeks. On an aggregated group-level, the dimensions were highly correlated between the two time points (between 0.77 and 0.89). More recently a study with over a thousand Dutch adolescents aged twelve to nineteen years replicated this finding over a three year period (Delsing et al., *in press*). However, these stabilities reflect a group-based, not intra-individual, or ipsative, consistency. Furthermore, Delsing et al. (*in press*) only cover the age range in which music taste seems to develop (ages 12 to 19). This paper extends the existing literature to a wider age range, concerns the consistency of musical taste within individuals and includes three separate conceptualizations of musical taste; artists, genres and styles.

The present study

This study was conducted in order to assess the intra-individual consistency of music preferences over time within a wide age range of adolescence and young adulthood. Music preference was assessed by asking participants to list their top three favourite artists, as well as assessing preference ratings for a wide range of musical genres. An internet panel consisting of adolescents and young adults participated three times in the course of 21 months. This time frame was considered a broad enough time frame to assess changes in music taste, because artists and bands move in and out of the charts so quickly; often in a matter of a few weeks.

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People can be expected to be differentially sensitive to that; some will maintain the same music preferences despite such changes in the charts, others will change preferences accordingly.

In addition to the question of ipsative consistency per se, differences were also investigated by age-group, gender and educational level. Music preference was hypothesized to be relatively inconsistent among adolescents between the ages of twelve and seventeen, who are still developing knowledge of music, along with a sense of personal and social identity, in which music taste is an important factor. Moreover, as the majority of adolescents prefer the music in the charts they may also be expected to be more sensitive to temporary processes of hypes. Gender and educational level are important in music taste per se (Hargreaves, 1986; LeBlanc, 1980), and therefore included in the analysis, but no specific hypotheses regarding the direction of differences in taste consistency by these factors were formulated.

Method

Sample

The study was conducted in collaboration with Qrius, Amsterdam. The sample was obtained by approaching members of an internet-panel part of the Qrius Switch-On project (see www.qrius.nl). Qrius is a market research bureau specialized in such topics as media use, free time, income and expenditures, education and work among children, youth, and young adults (age-range 6-30 years). The Switch-On project was conducted in collaboration with MTV Networks Benelux using an internet-panel aged 6 to 29 years. Participants are approached regularly on issues such as television viewing, norms and values, and music preferences. Rewards for participation are entry into draws for small prizes such as cd's, and a point-saving system in which participants get €10.00 after participating in a number of study waves. Participants were approached in April 2004, February 2005, and January 2006. The full panel consisted of 490 participants aged 12 to 29. As males were underrepresented (25.5%), males and females were matched in number, controlling for age and educational level. The random nature of the matching was ensured using a random number ascription available in SPSS 14.0.2. This resulted in a sample consisting of 236 respondents, with 118 females aged 12-29 (mean age 19.65, SD 3.49), and 118 males (mean age 19.97, SD 3.66).

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Measures

Level of education was represented by ten categories ranging from the lowest (pre-vocational) to the highest (pre-university) level of education. Respondents were asked which level of education they were currently receiving (for school-attendees), or had attended (for those who had left school), and were subsequently divided into low (low and middle vocational track; $n = 73$) and high (high vocational and academic track; $n=158$) level groups.

Age-groups were constructed by dividing respondents into 3 groups age 12 to 17 (school-going adolescents, mean age 15.87, S.D.=1.08, $n=70$), 18 to 22 (mean age 19.80, S.D.=1.36, $n=114$), and 23 and older (mean age 25.13, S.D.=1.70, $n=52$). Seventeen was chosen as a cut-off point to capture the group still attending secondary school. Twenty-three was chosen as the second cut-off age to compare our findings with those of Holbrook and Schindler (1989), who estimated that age to be most crucial in developing lifelong song preferences.

Music preferences were assessed by asking participants to list their top 3 most favourite artists or bands. They were also invited to rate twenty-six genres on a 5-point scale ranging from ‘dislike strongly’ to ‘like very much’, and a separate option for ‘don’t know this type of music’ (Ter Bogt, Raaijmakers et al., 2003). This range of genres was presented to allow for the many distinctions adolescents and young adults make regarding the music they listen to (Christenson & Peterson, 1988; Roe, K., 1985). The response category ‘don’t know this type of music’ was considered a missing and imputed along with preference ratings of related genres using the relative mean substitution developed by Raaijmakers (1999), a valid and reliable method for estimating missing values of (composite) Likert type scale scores (Bernaards & Sijtsma, 2000).

Distinctions do not imply unrelatedness (Christenson & Peterson, 1988), and exploratory factor analysis (Principal Axis Factoring, direct oblimin rotation, eigenvalues > 1) was used to analyze the underlying structure of the genre preferences within the time one data (see table 1). Explained variance was estimated to be 57.91% (using SPSS 14.0.2). Related genres are considered to represent a certain style, and the preference ratings of the genres Top 40 (chart-based music), ballads, boy bands, Latin pop, and Dutch pop proved to be related and were labelled Pop style. A second style was labelled Urban, and comprised the genres R&B,

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Table 1
Genre and style preference ratings over three waves

		<i>M (S.D.)</i>		
		April 2004	February 2005	January 2006
Pop		3.13 (0.83)	2.98 (0.77)	3.02 (0.78)
	Top 40	3.81 (1.09)	3.66 (1.09)	3.74 (1.06)
	Ballads	3.38 (1.12)	3.21 (1.05)	3.23 (1.10)
	Dutch Pop	3.36 (1.11)	3.36 (1.11)	3.40 (1.09)
	Latin	3.11 (1.15)	2.99 (1.07)	3.16 (1.04)
	Boybands	2.57 (1.23)	2.57 (1.18)	2.47 (1.13)
Urban		3.10 (0.95)	3.05 (0.88)	3.01 (0.88)
	Rap	3.19 (1.36)	3.19 (1.31)	3.02 (1.32)
	R&B	3.17 (1.40)	3.15 (1.36)	3.08 (1.28)
	Reggae	3.14 (1.13)	3.14 (1.05)	3.17 (1.07)
	Dancehall	2.87 (1.15)	2.73 (1.10)	2.77 (1.11)
Elite		2.97 (0.88)	2.97 (0.86)	3.05 (0.78)
	Soul-R&B	3.20 (1.22)	3.20 (1.22)	3.29 (1.08)
	Lounge	3.18 (1.20)	3.18 (1.20)	3.09 (1.09)
	Singer-songwriter	3.04 (1.11)	3.04 (1.11)	3.13 (1.09)
	Jazz	2.81 (1.21)	2.81 (1.21)	2.99 (1.15)
	Classical	2.60 (1.26)	2.60 (1.26)	2.74 (1.17)
Rock		2.92 (1.11)	2.90 (1.05)	2.85 (1.05)
	Rock	3.78 (1.25)	3.78 (1.18)	3.73 (1.16)
	Hardrock	3.05 (1.47)	3.00 (1.43)	2.90 (1.42)
	Alternative	2.96 (1.41)	2.97 (1.30)	3.03 (1.33)
	Punk	2.79 (1.27)	2.78 (1.21)	2.73 (1.23)
	Gothic	2.50 (1.27)	2.42 (1.24)	2.33 (1.16)
	Heavy metal	2.47 (1.39)	2.45 (1.31)	2.41 (1.32)
Dance		2.74 (1.02)	2.72 (0.96)	2.62 (0.97)
	Dance	3.42 (1.28)	3.46 (1.21)	3.34 (1.24)
	Trance	2.92 (1.44)	2.89 (1.37)	2.75 (1.28)
	Techno	2.58 (1.33)	2.61 (1.31)	2.56 (1.28)
	Electro	2.56 (1.21)	2.53 (1.16)	2.46 (1.21)
	Hardhouse	2.54 (1.44)	2.42 (1.37)	2.31 (1.30)

Note: Genre preferences measured on a five-point Likert type scale, ranging from 1 (dislike strongly) to 5 (like very much). Style scores were computed by averaging liking ratings of related genres. Relatedness was based on Exploratory Factor Analysis, described in text.

dancehall, rap/hip hop, and reggae. A third style was constructed based on relatedness in preference ratings of the genres classical music, singer/songwriter, jazz, soul/R&B, and lounge music, and was labelled Elite. A Rock style was constructed of the genres hard rock, heavy

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metal, rock, punk, alternative, and gothic. Finally, ratings of the genres dance, trance, electro, techno, and hardhouse were labelled as Dance. Preference ratings of genres within the styles Pop, Urban, Elite, Rock and Dance were summed and their means were taken as style-scores. This structuring of the genre ratings proved similar to previous Dutch, Flemish and American research on the structure of music preferences using factor analysis or multi-dimensional scaling techniques (Christenson & Peterson, 1988; Stevens; 2001; Ter Bogt et al. 2003; Tillekens, 1993), and was also replicated in the time 2 and time 3 datasets of the current study.

Analyses of consistency

Consistency of favourite artists. Participants were asked to name three of their favourite artists or bands, labelled artists. Consistency was measured by counting the number of times an artist's name was mentioned by a respondent across the three waves. The repeats were counted between the first and second, second and third, and first and third datasets, not taking the position in the top three into account. The total of these counts was divided by the maximum number of repeats possible (9) in order to rescale the counts on a 0 to 1 scale.

Consistency of genre preferences. Analyses of intra-individual consistency in genre preference ratings were computed using *q-correlation*. This was conducted within each style group separately. *Q-correlation* indexes pattern comparability within respondents between two points in time (Cronbach & Gleser, 1953; Dahlstrom & Humphrey, 1996; Roberts, Caspi & Moffitt, 2001; Van Aken, Van Lieshout & Haselager, 1996). The difference with the more ubiquitous Pearson's correlation is that individual responses as indicated on ordinal scales are not compared to the sample mean, but rather are compared to the mean of the respondent within a set of answers of that same respondent. Consistency measures were conducted on the individual's preference responses within style groups. For example, within the style labelled Pop, the sets of individual ratings of the genres Top 40 (chart-based music), ballads, boy bands, Latin pop, and Dutch pop were assessed for consistency. The individual's mean in preference for these genres was compared intra-individually between each two sets of time-points, as well as the relative deviation in ratings of the respective genres, whether positive or negative, resulting in one overall individual measure of consistency.

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In this study, data from three points in time were available. Pair-wise comparisons of patterns is facilitated by *q-correlation*, that is, patterns were compared between the first and second, the second and third, and first and third waves. As an overall consistency index, the individual's mean of these individual pairwise *q*-correlations was computed. This procedure resulted in measures of consistency in ratings within all 5 style groups, that is, Pop, Urban, Elite, Rock and Dance (see table 1 for overview of the styles and genres).

Consistency of style preference. Style scores were computed by computing the mean of the preference ratings of genres belonging to a single style, as determined through factor analysis. Style preference consistency, again, using *q-correlation*, concerns both the consistency in absolute and relative liking of the five styles. For instance, one can rate Rock types of music consistently highly, and more positively than Dance music, while liking Urban and Pop types of music both modestly and less consistently, and disliking Elite genres. The consistency in this pattern was assessed by *q*-correlating these ratings of the various styles, between the first and second, the second and third, and first and third data collection periods, and then computing the mean of these *q*-correlations.

Multivariate analyses

The intra-individual consistencies in artist, genre and style preferences were tested for differences between groups based on gender, educational level, and age. Univariate ANOVA's were conducted using the *q*-correlated styles preferences and the extent of favourite artist consistency as dependent variables. A MANOVA was conducted with the *q*-correlated style-grouped genre preferences as dependent variables.

Results

Popularity of artists

Table 2 displays which artists were mentioned most frequently at each point in time, by all participants, and by gender, educational level, and age-groups. Although individual lists ranged from the obscure to mainstream, the most popular artists reflected the chart-based list very well. Each group mentioned a variety of most favourite artists that represent a different

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Table 2

Most mentioned artists in favourite artist listings

	April 2004	February 2005	January 2006
<i>All participants (n=236)</i>			
	1) Marco Borsato ^f	DJ Tiësto ^f (20)	Robbie Williams (20)
	2) Robbie Williams (22)	Anouk ^f (22)	Marco Borsato (19)
	3) DJ Tiësto (20)	Kane ^f / Marco Borsato (15)	Anouk (18)
	4) Sugababes (16)	Keane / Linkin Park (12)	Shakira (17)
	5) N.E.R.D. (15)	Alicia Keys / Robbie Williams (11)	Coldplay (16)
<i>Gender</i>			
<i>females (n=118)</i>	1) Christina Aguilera / M.Borsato (12)	Anouk (16)	M. Borsato / Robbie Williams (13)
	2) Sugababes (10)	Alicia Keys (10)	Anouk / Shakira (11)
	3) Evanescence / Robbie Williams (9)	Marco Borsato (9)	Coldplay (10)
<i>males (n=118)</i>	1) DJ Tiësto / Robbie Williams (13)	DJ Tiësto (16)	DJ Tiësto / Kane (8)
	2) M. Borsato (11)	Linkin Park (9)	Anouk / Bløf ^f / R.H.C.P. / Robbie W. (7)
	3) N.E.R.D. (9)	Kane (8)	Coldplay / M. Borsato / Shakira / Kelly Clarkson (6)
<i>Age-groups</i>			
<i>12-17 (n=70)</i>	1) B. E. P. / Di-rect ^f / Usher (6)	DJ Tiësto (9)	Shakira (6)
	2) Kane / R.H.C.P. (5)	Kane / Linkin Park (5)	R.H.C.P. / DJ Tiësto (5)
	3) Christina Aguilera / Eminem (4)	Eminem / Jamie Cullum (4)	Coldplay / Jamie Cullum (3)
<i>18-22 (n=114)</i>	1) M. Borsato (14)	M. Borsato (12)	M. Borsato (14)
	2) Robbie W. (10)	Anouk / DJ Tiësto (9)	Anouk (9)
	3) DJ Tiësto / N.E.R.D. / Sugababes (8)	Kane / Usher (8)	Bløf (8)
<i>23-29 (n=52)</i>	1) DJ Tiësto / M. Borsato / Robbie W. (6)	Anouk (6)	Robbie W. (6)
	2) Alicia Keys (5)	Alicia Keys / DJ Tiësto (5)	Anouk / Coldplay / Kane / U2 (5)
	3) The Corrs, Metallica, N.E.R.D. (4)	Metallica / Robbie W. / U2 (4)	Madonna / Shakira (4)
<i>Educational level</i>			
<i>low (n=73)</i>	1) M. Borsato (11)	DJ Tiësto (9)	Robbie W. (8)
	2) DJ Tiësto (7)	Anouk (8)	Anouk (7)
	3) Bon Jovi / Kane / Robbie W. (6)	M. Borsato (7)	M. Borsato (6)
<i>high (n=158)</i>	1) Robbie W. (16)	Anouk / DJ Tiësto (14)	M. Borsato (13)
	2) DJ Tiësto (13)	Alicia Keys / Kane (11)	Robbie W. / Shakira (12)
	3) M. Borsato (11)	Bløf / M. Borsato / Robbie W. (8)	Anouk / R.H.C.P. (11)

^f= Dutch artist or band; B.E.P. = Black Eyed Peas; R.H.C.P. = Red Hot Chili Peppers

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variation of the same cohort of chart-topping artists. Younger respondents listed newer artists, such as B.E.P., and Di-rect (a young Dutch pop-punk band). Older participants listed more long-standing artists, such as Metallica, Madonna, Marco Borsato (a best-selling Dutch artist), and Robbie Williams. These artists have been popular for a longer time, and are older themselves.

Popularity of genres and styles

The most preferred musical style is Pop, followed sequentially by Urban, Elite, Rock and Dance (see table 1). Within these styles, certain genres are more popular than others. Within the Pop style, music found in the charts is liked best. The genres rap, R&B, and reggae are similarly popular within the Urban style, while the genres soul/R&B and lounge music top the Elite style. Of the Rock and Dance styles, the similarly labelled genres rock and dance are most popular. Least popular genres within the respective styles are boybands, dancehall, classical music, heavy metal and hardhouse.

Differences in style preferences were tested pair-wise for groups based on gender, educational level, and age. Females were more positive towards genres included in the styles Pop (all three waves) and Urban (1st wave only) ($p < 0.01$, η^2 between 0.03 and 0.13), while the Dance style was more popular among males (over three waves, $p < 0.01$, η^2 between 0.03 and 0.07). Participants from the lower educational level gave lower ratings for the style Elite in all three waves ($p < 0.01$, η^2 between 0.05 and 0.07), and higher ratings for Dance style in the second wave ($p < 0.05$, $\eta^2 = 0.02$). In terms of age differences, the seventeen to twenty-two years olds rated the Pop style lower than both their younger and older counterparts ($p < 0.05$, $\eta^2 = 0.03$). Other than that, the age-groups did not differ markedly in their liking of the four styles.

Consistency of favourite artists

Mean consistency in favourite artist was 0.32. This means that participants displayed on average a 32% overlap in top three lists of favourite artists (see table 3). The adjusted R^2 for the multivariate model was 0.11. Males and females did not differ significantly in terms of favourite artist consistency. Participants from the higher educational level were more consistent than those from the lower educational level (respectively 36% versus 28%, $p < 0.05$, partial $\eta^2 = 0.03$). Compared to the youngest age-groups, the older two were more consistent ($p < 0.01$,

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partial $\eta^2=0.10$). Respondents aged 12 to 17 repeated artist names in 21% of the cases. Among the 18 to 22 year old age-group, this increased to a consistency of 36%, and for the eldest age-group this increased to 39%.

Table 3
Consistency of favourite artists

	Estimated Marginal Means	(S.E)	F	df ¹	P	partial η^2
<i>Overall model</i>	0.16	0.01	8.13	4	0.00	0.13
<i>Univariate between subjects effects</i>						
<i>Gender</i>						
females	0.17	0.01				
males	0.16	0.01	0.11	1	0.74	0.00
<i>Educational level</i>						
low	0.14	0.01				
high	0.18	0.01	6.15	1	0.01	0.03
<i>Age-group</i>						
12-17	0.10	0.02				
18-22	0.18	0.01				
23-29	0.20	0.02	13.16	2	0.00	0.10

¹Error $df=226$; Adjusted $R^2 = 0.11$.

Table 4
Consistency of genre preferences

	Estimated Marginal Means	S.E.	F	df1	df2	p	partial η^2
<i>Multivariate tests</i>							
Gender			0.72	5	190	0.61	0.02
Educational level			1.25	5	190	0.29	0.03
Age-group			2.02	10	382	0.03	0.05
<i>Univariate tests of age-group differences</i>							
			<i>M (S.E.)</i>				
			12-17	18-22	23-29		
Pop	0.59	0.02	0.56 (0.04)	0.63 (0.03)	0.58 (0.04)		
Urban	0.54	0.03	0.50 (0.05)	0.56 (0.03)	0.55 (0.05)		
Elite	0.46	0.03	0.41 (0.05)	0.54 (0.04)	0.43 (0.06)		
Rock	0.60	0.02	0.53 (0.04)	0.59 (0.03)	0.67 (0.05)		
Dance	0.56	0.03	0.46 (0.04)	0.61 (0.03)	0.60 (0.05)		

Note: Age-group differences reached significance for consistency of Dance genres only with $F(2,194)=4.19$, $S.E.=0.10$, $p<0.05$, partial $\eta^2=0.04$.

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Consistency of genre preference

On the individual level, q -correlations ranged between -0.87 and +1. Table 4 displays the estimated means of the q -correlation coefficients of style-grouped genre preferences, which varied between 0.41 (consistency of ratings for genres within the Elite style among the youngest age-group) and 0.67 (consistency of ratings for the genres within the Rock style among the oldest age-group). There were no significant differences by gender or educational level. The three age-groups differed in terms of consistency in ratings of Dance genres. There was a lower consistency in preference for Dance genres among the youngest age-group (0.46), compared to the middle and oldest age-group (0.61 and 0.60 respectively, $p < 0.05$, partial $\eta^2 = 0.05$).

Table 5
Consistency of style preference

	Estimated Marginal Means	(S.E)	F	df ¹	p	partial η^2
<i>Overall model</i>	0.80	0.02	3.08	4	0.02	0.05
<i>Univariate between subjects effects</i>						
<i>Gender</i>						
females	0.83	0.02				
males	0.77	0.02	4.17	1	0.04	0.02
<i>Educational level</i>						
low	0.81	0.03				
high	0.79	0.02	0.28	1	0.60	0.00
<i>Age-group</i>						
12-17	0.76	0.03				
18-22	0.85	0.02				
23-29	0.78	0.03	3.66	2	0.03	0.03

¹error df=226; Adjusted R² = 0.04.

Note: overall range between -0.35 to 0.99.

Consistency of style preference

Consistency in style preference over time ranged between -0.35 and 0.99, and the mean consistency was 0.80 (see table 5). Females tended to be more consistent in their style preferences ($p < 0.05$, partial $\eta^2 = 0.02$). There were no significant differences by educational level. The youngest age-group was less consistent than the middle age-group ($p < 0.05$, partial $\eta^2 = 0.03$). The oldest age-group did not differ significantly from the other two age-groups.

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However, for the multivariate model with group differences posed for gender, educational level and age-groups, R^2 was 0.05 (adjusted $R^2=0.04$) and thus these the differences reported by gender and age, although significant, are not substantial.

Discussion

This study aimed at assessing intra-individual consistency in lists of favourite artists, and in preference ratings for range of genres and five main musical styles, over three points in time in a 21 month period. Factor Analysis of genre preferences resulted in five styles labelled, in order of relative popularity; Pop, Urban, Elite, Rock, and Dance. Similar genre and style structures have been identified in studies conducted in a variety of Western countries (Christenson & Peterson, 1988; Delsing et al., *in press*; Rentfrow & Gosling, 2003a; i.e., USA, Sweden, Belgium, the Netherlands, see Roe, K., 1985; Stevens, 2001; Ter Bogt, Raaijmakers et al., 2003; Tillekens, 1993). Overall, the intra-individual consistency coefficients ranged from perfect inconsistency to perfect consistency. Consistency in favourite artist listing was moderate. Consistency in genre preferences was moderate to high, while on average, style preferences are highly consistent.

Previously identified gender differences in music taste, such as females preferring softer, romantic types of music whereas males tend to prefer harder types of music (Christenson & Peterson, 1988; Frith, 1983; North & Hargreaves, 2007a) led to the question of potential differences in preference stability. The gendered difference in musical taste itself was replicated. That is, females were more likely to report preferences for Pop and Urban styles, whereas males were more positive towards the more monotonous Dance style. Gender differences with the styles of Rock and Elite were minimal. In the 1970s, the Rock audience was predominantly male (Frith, 1981), but during the 1980s and 1990s this changed, and by the beginning of the 21st century, at least in the Netherlands, few gender-based differences in the Rock audience remain (Mulder et al., 2007). In terms of consistency over time in musical preferences, there were no gender differences in expressed genre preferences or favourite artist listings. Females were more consistent in their relative liking of the five styles Pop, Urban, Elite, Rock and Dance, but the differences were not substantial.

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Educational level was positively associated with favourite artist consistency, but not with consistency of style or genre preferences. Numerous previous studies have found social class to be of relevance in music taste studies, and we found educational level was associated positively to the style Elite, and negatively to the style Dance. However, consistency of preferences for broad styles and genres appears to operate similarly across social strata, as an absence of effects here underlines.

Age-group was thought to relate to consistency in music preference as involvement with and knowledge of music increase during adolescence (Christenson & Roberts, 1998a), and because music taste can be such a powerful tool in the developmental task at hand during adolescence, that is, identity formation (Erikson, E. H., 1968; Tarrant et al., 2002). The importance of peers in this process, reflected in the wide popularity of chart-based music among young adolescents, makes the age-group of twelve to seventeen years olds most susceptible to the latest hypes. Moreover, increased cognitive capacity could broaden the musical horizon following increased need for musical complexity (North & Hargreaves, 1997). Therefore, the youngest age-group was expected to show the least consistency in music taste. Age did indeed prove to be positively related to favourite artist consistency. Compared to the older two age-groups of late adolescents and young adults, the twelve to seventeen years olds not only listed younger and newer artists, they also displayed a higher turnover rate in who they liked best. In line with Holbrook and Schindler's (1989) finding that lifelong song preferences crystallized (or consolidated) at the age of twenty-three, we found the oldest age-group indeed displayed the highest consistency in lists of favourite artists.

Regarding consistency of genre preferences, age-groups were similarly consistent, with the exception of ratings of Dance genres. Here, the youngest age-group was less consistent compared to the two other, older age-groups. This makes sense considering the association between dance music and clubbing, or going out, which is not yet optional for most twelve to seventeen year olds. It could be argued that music taste develops at least partially in conjunction with culturally staged accessibility. Contrary to our hypotheses however, consistencies in the genre ratings other than Dance genres did not increase significantly with age. In terms of style preferences, participants aged twelve to seventeen were less consistent than the eighteen to twenty-two years olds, but overall, consistency of style preference was remarkably high for all three age-groups. Thus artist preferences may function differently than

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broader judgements of the genres and styles. It seems music taste defined broadly, is already well-defined at the beginning of adolescence.

In conclusion, our study suggests musical taste is surprisingly consistent even for the age-group twelve to seventeen, and is even more consistent among older youth and young adults. We argue that although gender and social class function as determinants in music taste itself (Bourdieu, 1979; Bryson, 1996; Christenson & Peterson, 1988; Coulangeon & Lemel, 2007; Dibben, 2002; Eijck, 2001; Gans, 1999; Hargreaves, 1986; North & Hargreaves, 2007b; Peterson, 1996), they are not of marked influence on patterns of continuity and change in such individual preferences, that is, (in)stability of music preferences appears to be similar across these social strata. At the intra-individual level, taste consistency can vary widely, and the turnover rate of favourite artists was very high. Nevertheless the majority of adolescents and young adults display high consistency in their preferences for music broadly divided into styles, and moderate to high consistency at the genre level.

Finally, the sample of participants was part of an internet-panel, and therefore inherently limited to those who were computer literate. As the digital divide can be observed in a developed country like the Netherlands (Van Dijk, 2006), a bias in the responses due to lack of representativity of the general population of twelve to twenty-nine years olds could arise. Studies comparing web-based surveys versus paper- or telephone-based surveys have reported weighing for demographic representativeness is necessary, especially among the older populations (Berrens, Bohara, Jenkins-Smith, Silva & Weimer, 2003; Couper, Kapteyn, Schonlau & Winter, 2007). However, among the twelve to twenty-nine years olds in this study, internet access is more ubiquitous, and problems associated with the digital divide may therefore be less prominent. Studies aimed specifically at comparing web-based surveys with pen-and-paper surveys on measures of substance use among children (3rd and 4th grade) and undergraduate college students indicated few substantive differences (McCabe, Boyd, Young, Crawford & Pope, 2005; McCabe, Couper, Cranford & Boyd, 2006; McCabe, Diez, Boyd, Nelson & Weitzman, 2006). Therefore, the use of an internet-panel may not necessarily be a problem in this situation.

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Limitations

Although our research provides a window onto the consistency of music taste intra-individually, questions remain regarding the nature of the development of music taste. To capture that process, information on developmental issues such as increased capacity for cognitive processing and identity formation would be necessary. Therefore, we cannot rule out that the (slight) increase in consistency of genre and style ratings does not merely reflect increased knowledge of the music field, and thus more reliable preference ratings. Longitudinal monitoring of children and adolescents regarding the sources of variation in music taste identified by LeBlanc (1980), capturing both the cognitive, emotional and social characteristics of individuals would be needed. In addition, following people over a longer period of time than in our study and starting at a younger age than twelve would further help elucidate the formative mechanisms of music taste. Conversely, and specifically regarding the lists of favourite artists, shorter time intervals between data collection episodes would also be interesting as artists can move in and out of popularity in a matter of weeks. The importance of music in most people's lives certainly warrants further investigations into the nature of music taste.

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STUDY 2

The soundtrack of substance use: Music preference and adolescent smoking and drinking

Based on: Mulder, J., Ter Bogt, T.F.M., Raaijmakers, Q.A.W., Nic Gabhainn, S., Monshouwer, K., & Vollebergh, W.A.M. (*in press*). The soundtrack of substance use: Music preference and adolescent smoking and drinking. *Substance Use and Misuse*.

Abstract

A connection between preferences for heavy metal, rap, reggae, electronic dance music, and substance use has previously been established. However, evidence as to the gender-specific links between substance use and a wider range of music genres in a nationally representative sample of adolescents has to date been missing. In 2003, the government funded the Dutch National School Survey on Substance Use (DNSSSU), a self-report questionnaire among a representative school-based sample of 7,324 adolescents aged 12 to 16 years, assessed music preference, tobacco and alcohol use, and a set of relevant covariates related to both substance use and music preference. Overall, when all other factors were controlled, punk/hardcore, techno/hardhouse and reggae were associated with more substance use while pop and classical music marked less substance use. While prior research showed that liking heavy metal and rap predicts substance use, in this study a preference for rap/hip hop only indicated elevated smoking among girls, whereas heavy metal was associated with less smoking among boys and less drinking among girls. The types of music that mark increased substance use may vary historically and cross-culturally, but, in general, preferences for non-mainstream music are associated positively with substance use and preferences for mainstream pop and types of music preferred by adults (classical music) mark less substance use among adolescents. As this is a correlational study no valid conclusions on the direction of causation of the music substance use link can be drawn.

Introduction

From early adolescence, music becomes increasingly important as a central aspect of youth culture (North et al., 2000; Roberts, 2000). Studies indicate a considerable amount of listening time, increasing from about an hour per day during early grade school to three hours or more by the end of high school (e.g. (North & Hargreaves, 2003; Roberts & Christenson, 2001; Roberts & Foehr, 2001). On the contrary, the use of television shows the opposite relationship to age, averaging about three hours in grade school followed by a drop to around two hours a day by 12th grade. Although both media are important at all ages, television can be properly called the medium of childhood, music the medium of adolescence. Popular music mirrors important life events and concerns of young people as it regards courtship, romance, sexuality, the breakdown of relationships, and associated hurt feelings. It is an important medium with regards to different topics ranging from fashion statements to political attitudes. Music functions as an energizer, a mood enhancer, a medium that consoles and fends off boredom, it is important for the formation of knowledge of the world and, hence, identity (Christenson & Roberts, 1998b; Schwartz & Fouts, 2003; Ter Bogt, 2007). Music preference is important for friendship selection, while peer groups define in- and out-group through their affinity with music genres (Bakagiannis & Tarrant, 2006; North et al., 2000; Rentfrow & Gosling, 2006; Selfhout, Delsing, Meeus & Ter Bogt, 2007).

Though overall, music's role in adolescent lives is positive there have been comments to its supposed negative influences on young people. The potential influence of music, its lyrics and video clips and the function of pop stars as role models has raised concerns among parents and other educators, as certain types of music may play a role for the onset and continuation of adolescent substance use.. As music is an important and penetrating medium for most adolescents we believe it is indeed important to study this medium in relation to substance use, specifically in a country with high to extremely high prevalences of adolescent tobacco and alcohol use (Currie et al., 2004). Several investigations have illustrated that music and music videos have come to the attention of the alcohol industry and have been used as a tool to market alcohol (Alaniz & Wilkes, 1998; Herd, 2005). However, to our knowledge there exist only a few experimental studies directly exposing causal links between music exposure and for instance, alcohol consumption (e.g. (Bach & Schaefer, 1979; North & Hargreaves, 1996; North, Shilcock & Hargreaves, 2003), indicating that the tempo of music is linked to drinking alcohol in bars and music genre to buying/ordering

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alcohol in shops and in restaurants. Survey studies have shown that music preference is linked to substance use patterns in young people; studies in the US showed that heavy metal fans are more often engaged in reckless behaviours, such as drunk driving, unsafe sex, drug use and minor criminal activity (Arnett, 1991b; Stack, Gundlach & Reeves, 1994; Took & Weiss, 1994). Forsyth, Barnard and McKeganey (1997) showed that rave music (a.k.a. house) was positively related with the use of all kinds of legal and illegal substances, including alcohol among Scottish youth. A Canadian study on music genres and deviant behaviours points to the significant links between rap music and deviant behaviours such as violence, aggression, soft drugs, and alcohol use (Miranda & Claes, 2004). More recent, Chen, Miller, Grube, & Waiters (2006) found that, even when controlling for an important personality factor (sensation seeking), preferences for rap, techno and reggae were positively associated with smoking and drinking, indicating that music may have effects independent of personality characteristics that are linked to these music preferences and substance use.

However, these studies have particularly focused on music styles with deviant reputations, in particular heavy metal and gangstarap. It is thus unknown whether preference for other mainstream or non-mainstream genres is also associated, positively or negatively, with substance use. Furthermore, previous studies have included relatively small samples, frequently college students rather than adolescents, and the music preference – substance use link has yet to be tested in large representative samples of adolescents. Although music preference has been linked to risk behaviour and substance use in a number of English speaking countries (USA, UK, Canada, Australia) research in other countries is scarce.

This study was conducted as part of a large national epidemiological survey study among school-going adolescents. Previous research has shown that preferences for loud, energizing types of music are related to the quality of the relationship with parents and peers (negatively), to peer and parental substance use (positively) and school level and school achievement (negatively), and that fans of these types of music more often stem from single parent families (Arnett, 1991a, 1991b; Roe, Keith, 1985, 1992; Roe, 1995; Took & Weiss, 1994; Weinstein, 2000b). This same set of characteristics has been shown to be related to substance use in other (Dutch epidemiological) studies (i.e. (Monshouwer et al., 2006; Petraitis, Flay & Miller, 1995; Verdurmen, Monshouwer, Van Dorsselaer, Ter Bogt & Vollebergh, 2005). In the DNSSSU the importance of music preferences for alcohol and tobacco use was

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assessed, controlling for factors such as household composition and relationship with parents, school achievement, and perceived parental and peers' substance use. Analyses were run separately for both genders, as previous studies have not only shown gender-based differences in preferences of musical genres themselves (Christenson & Peterson, 1988), but also differential associations with substance use. In sum, the current study entails (1) an exploratory effort to test the links between a wide range of musical genres and substance use, in (2) a large nationally representative sample of adolescents, while (3) including a set of relevant covariates of substance use and music preference as confounders, in (4) a non-English speaking country known for its high substance use among adolescents.

Method

Sample

The data were derived from the 2003 Dutch National School Survey on Substance Use, a cross-sectional study conducted every 4 years since 1984 that is supported by the Dutch Ministry of Health, Welfare and Sport. The sample was obtained by using a two-stage random sampling procedure from all secondary schools in the Netherlands. Schools were stratified according to level of urbanization and drawn proportionally to their number in the corresponding urbanization level. Within each school, a maximum of 5 classes (depending on school size) were randomly selected. The 10, 11, 17 and 18 year olds were excluded, because at these ages school students are not representative for the Dutch adolescent population. Part of the 10 and 11 year olds are still attending primary education and part of the 17 and 18 year olds have already left school (in the Netherlands school is compulsory up to age 16). The resulting sample comprised 7,324 students (mean age 13.91 years). The school response rate was 72% (192 out of 268 schools). Non-response mainly had to do with participation in other research (65%). Responding and non-responding schools did not differ on urbanisation level or school size. Within classes an average of 7% of the students were not included, primarily due to illness. Parents were informed of the topic of the study and were free to indicate whether they did not want their children to participate in this study by returning a letter or an e-mail (passive consent). No single parent objected to having his/her child interviewed.

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Data collection

The DNSSSU is a survey that targets substance use and its correlates among adolescents in the Netherlands. The question format is derived from other large scale investigations into substance use such as ESPAD (Europe), HBSC (Europe and US) and Monitoring the Future (US). Student data were collected by questionnaire, administered in regular classes by trained assistants. These assistants briefly introduced themselves and the study, and asked the students to answer the questions as best as they could. They stressed the anonymity of the process. Questionnaires did not ask for the names of students. After students finished answering the questionnaires, these were collected, and put into an envelope that was sealed in front of their eyes. Teachers were asked to leave or take a place at the back of the classroom.

Measures

Music preference was assessed using eight music genres that pupils could each rate on 5-point scales ranging from 1 ‘dislike strongly’ to 5 ‘like very much’, with a separate option for ‘don’t know this type of music’ (Ter Bogt, Raaijmakers et al., 2003). The presented genres were representative of the scope of music available across Europe and North-America (Christenson & Peterson, 1988; Mulder, Ter Bogt, Raaijmakers & Vollebergh, 2007; Ter Bogt, Raaijmakers et al., 2003; Tillekens, 1993), i.e. chart-based pop music (the Dutch Top 40 of pop songs); the popular Afro-American music: rap/hip hop, an Afro-Caribbean genre: reggae; two genres from the Rock spectrum: heavy metal and punk/hardcore; two forms of Dance music: house/trance and techno/hardhouse; and classical music. Missing scale item values were imputed using the relative means substitution approach (Raaijmakers, 1999).

Prevalence of cigarette smoking was assessed by asking students the number of times they had smoked cigarettes during the past month. Answers were recoded, resulting in two categories: ‘never’ and ‘used once or more’. *Prevalence of alcohol consumption* was assessed in the same way.

Covariates

School level was represented by four categories ranging from the lowest (pre-vocational) to the highest (pre-university) level of education. This variable was recoded into

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dummy variables based on these categories, and the latter was taken as the reference category. *(Perceived) School achievement* was assessed on a scale ranging from 1 ‘very well’ to 5 ‘very unsatisfactory’. These were dummy-recoded with the first category as the reference. *Household composition* was dichotomized into 1 ‘living with both biological parents’ and 0 ‘otherwise’. *Support from parents and friends*, was perceived support from father, mother and best friend (Settertobulte, 2000). The question asked: ‘How easy is it for you to talk to the following persons about things that really bother you?’, with the response categories ‘very easy’, ‘easy’, ‘difficult’, ‘very difficult’, or ‘don't have or see this person’. The five answer categories were recoded into three dummies ‘high support’, which was the reference, ‘low support’ and ‘don't have or see this person’. *Perceived parental substance use* was assessed by asking ‘Does your father or mother ever do the following things?’, with separate scales for father and mother with ‘never’, ‘now and then’, ‘every week’, ‘every day’, ‘will not or cannot answer’, for cigarette smoking and drinking alcohol. Categories were dummy-recoded with the first category used as the reference category. *Perceived peer substance use* was assessed by asking ‘How many of the boys and girls you hang out with drink alcohol/ smoke cigarettes at least once a week?’, with the options ‘none’, ‘a few’, ‘half’, ‘most, and ‘all’. These categories were dummy-recoded with the first category as the reference group.

Preliminary analyses

Before running multivariate logistic regression models, the bivariate correlations between the music preference scales and the covariates were examined, as were multicollinearity diagnostics from linear regression models within SPSS 12.0.2, 2004. Correlations between music preference scales varied between -0.12 and 0.63, while correlations between preference scales and the covariates varied between -0.08 and 0.21. Colinearity diagnostics showed tolerance statistic values over 0.49, and VIF values below 1.99. Multicollinearity was therefore not considered a problem.

Analyses

The two-stage random sampling procedure had to be taken into account in the analysis. First, students from the same school were drawn as a cluster. A cluster sample will not affect point estimates such as prevalence rates, but it does affect variance-related estimates. In order

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to obtain correct 95% CIs and p -values robust standard errors were obtained via the Huber/White/Sandwich method from Stata (Stata Corporation, 2001).

Multivariate logistic regression models were run for both alcohol and tobacco use. Model 1 included the music variables and substance use. Model 2 tested the predictive power of music preference when controlling for confounders, i.e. age, household composition, school level, school achievement, perceived peer and parental substance use, and perceived support from mothers, fathers and best friends, by gender. For all models, the odds ratios (and confidence intervals) are presented, plus the associated Nagelkerke's R-squared values, as an approximation of the level of explained variance.

Results

Descriptives

Table 1 displays differences in appreciation of the musical genres. Boys and girls differ in their music taste (t-tests, $p < .001$). Among girls, chart-based pop music is the most popular music and rap/hip hop is also highly preferred. Girls do not particularly like or dislike genres such as house/trance and reggae, while they generally do not appreciate punk/hardcore, techno/hardhouse and particularly heavy metal and classical music. Among boys rap/hip hop is the most popular music, followed by chart-based pop and house/trance. They do not particularly like or dislike punk/hardcore, techno/hardhouse and reggae, but generally dislike heavy metal and particularly classical music. Gender differences emerged for pop and classical music, which were more popular among girls, whereas metal, punk/hardcore, house/trance, and techno/hardhouse were more popular among boys. Overall, girls prefer music that is more melodic and mainstream (pop) or melodic and sophisticated (classical music), while boys tend to prefer noisy (metal, punk/hardcore) or highly energetic genres (house/trance, techno/hardhouse).

Next age differences were uncovered (ANOVAs, $p < .001$). The popularity of pop music's heart, chart music, declines somewhat during the period from 12 to 16 years. The same holds for rap/hip hop, house/trance and techno/hardhouse, while a relatively substantial drop in popularity was found for heavy metal and punk/hardcore. Thus, loud rebellious music seems to be particularly popular in early adolescence among boys. The only exception to this downward

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trend in popularity is classical music. Its popularity forms an U-shaped curve, with classical music being relatively popular among 12 and 16 year olds and lower affinity scores in between. Month-prevalence of smoking cigarettes is 21.5% for girls, and 16.5% for boys. Month-prevalence of drinking alcohol is 55.0% for girls, and 57.6% for boys.

Table 1.
Music preferences by gender, age and educational level

	Pop	Rap/ Hip hop	Heavy metal	Punk/ Hard- core	House/ trance	Techno/ hard- house	Reg- gae	Clas- sical music
Gender								
Girls	4.0 ¹	3.6	2.3 ¹	2.6 ¹	3.1 ¹	2.5 ¹	2.9	2.0 ¹
Boys	3.5 ²	3.6	2.6 ²	2.9 ²	3.4 ²	3.0 ²	2.8	1.8 ²
Age								
12	3.8 ¹	3.7 ¹	2.6 ¹	2.9 ¹	3.4 ¹	2.9 ¹	2.8	2.0 ¹
13	3.8 ^{1,2}	3.7 ¹	2.5 ^{1,2}	2.8 ¹	3.2 ^{1,2}	2.7 ^{1,2}	2.8	1.8 ²
14	3.7 ^{1,2}	3.7 ¹	2.4 ^{2,3}	2.8 ^{1,2}	3.2 ²	2.7 ²	2.8	1.9 ^{1,2}
15	3.7 ^{1,2}	3.6 ^{1,2}	2.2 ³	2.6 ²	3.2 ²	2.7 ²	2.8	1.9 ^{1,2}
16	3.6 ²	3.4 ²	2.1 ³	2.5 ²	3.1 ²	2.6 ²	2.9	2.1 ¹
Education								
Low	3.7 ¹	3.7 ¹	2.4	2.8	3.4 ¹	2.9 ¹	2.8	1.7 ¹
Low//Mid	3.8 ²	3.8 ¹	2.4	2.8	3.3 ¹	2.8 ²	2.8	1.8 ²
Mid/High	3.8 ²	3.6 ²	2.4	2.7	3.1 ²	2.6 ³	2.8	2.0 ³
High	3.9 ³	3.5 ³	2.4	2.7	3.0 ³	2.4 ⁴	2.9	2.2 ⁴

Note: Mean scores, Likert scales 1 ‘dislike this music strongly – 5 ‘do like this music very much’. Different superscripts indicate differences between boys and girls, age groups and educational levels, respectively (t-tests, ANOVAs, $p < .001$).

Tobacco use

Tables 2a and 2b illustrate the two models for girls (table 2a) and boys (table 2b). For girls, in model 1, the model with only music preferences as predictors, liking pop or classical music is negatively associated with smoking (O.R.’s 0.66 - 0.75), while liking rap/hip-hop, reggae, house/trance, and techno/hardhouse is positively associated with smoking (O.R.’s 1.14 - 1.34). In the second model, appreciation of rap/hip no longer predicts smoking, but

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house/trance, techno/hardhouse and reggae are positively associated with tobacco use, and pop and classical music negatively, even when all other variables are controlled (O.R.'s 0.82-1.21). Nagelkerke's R^2 of the two models are 0.12 and 0.47, respectively.

Table 2a
Logistic Regression Analysis: Music Preference and Last Month Tobacco Use among Girls

	Model 1 Music preferences		Model 2 Music preferences + background characteristics + number of peers smoking	
	O.R.	95% C.I.	O.R.	95% C.I.
Chart-based	0.66***	0.60-0.72	0.83**	0.73-0.94
Rap/Hip Hop	1.16***	1.06-1.26	-	-
Heavy Metal	-	-	-	-
Punk/Hardcore	-	-	-	-
House/Trance	1.24***	1.13-1.36	1.21**	1.09-1.35
Techno/Hardhouse	1.34***	1.24-1.45	1.15**	1.04-1.28
Reggae	1.14**	1.04-1.24	1.13*	1.01-1.25
Classical music	0.75***	0.69-0.82	0.82***	0.73-0.91
Nagelkerke's R^2	0.12		0.47	
Model improvement ^a	292.73	($df=6, p=.000$)	1245.79	($df=23, p=.000$)
<i>N</i>	3694		3470	

***= $p<.001$, **= $p<0.01$, *= $p<0.05$

^a χ^2 measuring change in $-2 \log$ -likelihood from the previous model

For boys (table 2b), in the first model liking pop, heavy metal, house/trance and classical music are negatively associated with smoking (O.R.'s 0.66 - 0.86). Liking punk/hardcore, techno/hardhouse and reggae is positively associated with tobacco use (O.R.'s 1.26 - 1.36). In model 2 the same pattern applies, except that preference for house/trance is no longer significantly associated with smoking (O.R.'s 0.76- 1.29). Nagelkerke's R^2 for the two models are 0.13 and 0.44, respectively.

Thus, music preferences significantly and substantially mark tobacco use with effects that can be qualified as medium (Cohen, 1988b). Introducing confounders in the models considerably raises the level of explained variance, and most links between music preferences

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and tobacco use remain significant, indicating that music’s association with tobacco use is only partly explained by the effects of these covariates.

Table 2b
Logistic Regression Analysis: Music Preference and Last Month Tobacco Use among Boys

	Model 1 Music preferences		Model 2 Music preferences + background characteristics + number of peers smoking	
	O.R.	95% C.I.	O.R.	95% C.I.
Chart-based	0.66***	0.60-0.73	0.76***	0.67-0.85
Rap/Hip Hop	-	-	-	-
Heavy Metal	0.79***	0.73-0.87	0.90*	0.81-1.00
Punk/Hardcore	1.32***	1.21-1.45	1.25***	1.11-1.39
House/Trance	0.86**	0.77-0.95	-	-
Techno/Hardhouse	1.36***	1.22-1.50	1.29***	1.13-1.46
Reggae	1.26***	1.15-1.37	1.14*	1.03-1.27
Classical music	0.76***	0.68-0.85	0.85*	0.74-0.98
Nagelkerke’s R ²	0.13		0.44	
Model improvement ^a	241.57 (df=7, p=.000)		890.26 (df=23, p=.000)	
N	3167		2935	

***= $p < .001$, **= $p < 0.01$, *= $p < 0.05$

^a χ^2 measuring change in $-2 \log$ -likelihood from the previous model

Alcohol use

Table 3a shows that among girls a preference for classical music and heavy metal is negatively associated with last month drinking (O.R.’s 0.81-.83), while preference for punk/hardcore, house/trance and reggae is positively associated with alcohol use (O.R.’s 1.15 - 1.30). Adding the confounders results in the same pattern of associations, except that heavy metal is no longer a significant predictor (O.R.’s 0.80 - 1.31). Nagelkerke’s R² of the two models are 0.08 and 0.46, respectively. For males (table 3b) a preference for pop, rap/hip hop and classical music is associated negatively with alcohol use (O.R.’s 0.88 - 0.93), while preferring punk/hardcore and techno/hardhouse is associated positively with drinking (O.R.’s 1.19 - 1.23). When controlling for confounders the associations with preference for chart-based

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Table 3a

Logistic Regression Analysis: Music Preference and Last Month Alcohol Use among Girls

	Model 1 Music preferences		Model 2 Music preferences + background characteristics + number of peers smoking	
	O.R.	95% C.I.	O.R.	95% C.I.
Chart-based	-	-	-	-
Rap/Hip Hop	-	-	-	-
Heavy Metal	0.83***	0.76-0.90	0.94	0.85-1.05
Punk/Hardcore	1.30***	1.21-1.41	1.14*	1.03-1.26
House/Trance	1.26***	1.19-1.34	1.31***	1.21-1.42
Techno/Hardhouse	-	-	-	-
Reggae	1.15***	1.07-1.23	1.15**	1.05-1.25
Classical music	0.81***	0.76-0.87	0.80***	0.73-0.88
Nagelkerke's R ²	0.08		0.46	
Model improvement ^a	209.22	(df=5, p=.000)	431.92	(df=21, p=.000)
N	3594		3383	

***= $p < .001$, **= $p < 0.01$, *= $p < 0.05$

^a χ^2 measuring change in $-2 \log$ -likelihood from the previous model

and rap/hip hop are no longer significant, but a significant negative association between classical music and alcohol use remained, next to positive associations with punk/hardcore and techno/hardhouse (O.R.'s 0.87-1.18). Nagelkerke's R² of the two models are 0.07 and 0.41, respectively.

Again, music preferences significantly and substantially mark alcohol use with effects that can be qualified as medium (Cohen, 1988b). Once more, controlling for other variables considerably increases the level of explained variance, however even in the full model music preferences predict alcohol use significantly, indicating that music's association with alcohol use is only partly explained by the effects of these covariates.

Mediation

In the first model music preferences are significantly associated with substance use, with medium effect sizes in the 7 – 12 % range (Cohen, 1988b). Introducing background characteristics, quality of parent and peer relationships and perceived peer use both increases

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the explanatory power of the second model to 41-47% and decreases the OR's associated with music preferences to a certain extent, though music still predicts substance significantly in most cases.

Table 3b
Logistic Regression Analysis: Music Preference and Last Month Alcohol Use among Boys

	Model 1 Music preferences		Model 2 Music preferences + background characteristics + number of peers smoking	
	O.R.	95% C.I.	O.R.	95% C.I.
Chart-based	0.90**	0.84-0.97	-	-
Rap/Hip Hop	0.93*	0.87-0.98	-	-
Heavy Metal	-	-	-	-
Punk/Hardcore	1.19***	1.11-1.28	1.18***	1.08-1.30
House/Trance	-	-	-	-
Techno/Hardhouse	1.23***	1.15-1.31	1.16***	1.08-1.26
Reggae	-	-	-	-
Classical music	0.88**	0.82-0.95	0.87**	0.80-0.96
Nagelkerke's R ²	0.07		0.41	
Model improvement ^a	152.55 (<i>df</i> =6, <i>p</i> =.000)		1036.75 (<i>df</i> =20, <i>p</i> =.000)	
<i>N</i>	3057		2854	

***=*p*<.001, **=*p*<0.01, *=*p*<0.05

^a χ^2 measuring change in $-2 \log$ -likelihood from the previous model

The preliminary analysis showed that music preferences are associated with (perceived) peer use and in model this emerged as the strongest predictor of tobacco and alcohol use (not reported in table 2-3). As both music preferences, and even more so peer use, are clearly linked to substance use and the introduction of peer use in the analysis decreases the OR's related to music preference, this indicates mediation (Baron, R. M. & Kenny, D. A., 1986). More precisely, peer substance use *partly* mediates the link between music preferences, and alcohol and tobacco use, as the significant model 2 music preference OR's indicate that there is a residual direct effect from music to substance use. Reversing the order of introduction of the variables in the models with all covariates first and then music preferences, showed that the increment in explained variance linked this residual effect is still 2-5% (not reported in table 2-3).

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In sum: music preferences are significantly and substantially linked to substance use, the link between music preferences and substance use is partially mediated by peer use, and a direct predictive effect of music on substance resides even when all other variables, including peer use, are controlled.

Discussion

This study aimed at assessing the importance of a wide range of music genre preferences for adolescent tobacco and alcohol use in a nationally representative sample, while controlling for factors that have been shown to be relevant for both music preferences and substance use. Overall, when confounders are controlled, punk/hardcore, techno/hardhouse and reggae are associated with more substance use while pop and classical music mark less substance use. Heavy metal preference indicates less drinking among girls and less smoking among boys. For girls a rap/hip hop preference is associated with more smoking, but no relation to substance use was found for boys. Among girls liking house/trance indicates more smoking, but among boys liking house/trance was associated negatively with smoking and there was no relation to drinking.

Our results corroborate earlier studies in which music preference emerged as a predictor of substance use (Arnett, 1991b; Chen, M.J. et al., 2006; Forsyth et al., 1997; Miranda & Claes, 2004; Roe, 1995). The music variables alone account for 7 – 13% of the variance in substance use, indicating that music preference is a relevant factor for modeling substance use. In models where confounders such as gender, age, household composition, quality of relations with parents and peers, and perceived parent and peer substance use are controlled, music still accounts for 2-5% of the explained variance. Hence, music's effect is partly explained by the social composition of groups of fans and by covarying factors such as parent and peer use.

We found particular evidence for a mediation role of peer use in the link between music preferences and tobacco and alcohol use. Prior research has shown that music is an important conversation topic in situations where strangers meet and that the disclosure of music taste is perceived an indicator of personality (Rentfrow & Gosling, 2006). In early phases of friendship music is relevant for bringing people closer (Bakagiannis & Tarrant, 2006; Selfhout, M. H. M. et al., 2007). Young people with certain music tastes may not only seek others with the same

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taste patterns, they may also end up with friends that smoke and drink more or, for that matter, less, as music taste is linked to peer substance use. Peer substance use, in turn, may drive the onset or continuation of smoking and drinking. However, different conceptualizations of these links are possible. Other researchers have convincingly argued that peer substance use itself is a factor for choosing or rejecting friends (e.g. (Kandel, 1978) and these friends may be of importance for the (further) development of music taste as group membership solidifies taste (Tarrant, 2002; Tarrant, North & Hargreaves, 2001). As our study was exploratory in nature and did not entail a sketch of the longitudinal trajectory of music taste and substance use development it is impossible to reach any further conclusions on the nature and timing of these associations. We can conclude, however, that even in the full models, music remained significantly associated to substance use, indicating that music's role in the explanation of substance use cannot be entirely explained by the social composition of groups of fans or mediation through, particularly, peer use.

Previous research has identified a positive association between loud, 'defiant' music and substance use, and tried to explain this association by pointing out the utility of both rebellious music preferences and substance use for adolescents who feel like revolting against authority, who are inclined to sensation seeking, or want to project a grown-up image e.g. (Arnett, 1991b; Arnett, 1996; Chen, M.J. et al., 2006; Forsyth et al., 1997; Roe, 1995; Stack et al., 1994; Took & Weiss, 1994; Weinstein, 2000b). Earlier research has therefore focused on brash, energetic music with a lyrical content that may shock parents, teachers and other adults: heavy metal and the defiant hip hop music known as 'gangstarap'. In this study, other types of music surfaced as overall risk factors for smoking or drinking; punk/hardcore, techno/hardhouse and reggae. While these genres widely differ musically, as punk/hardcore lies within the rock spectrum, techno/hardhouse is electronic dance music and reggae an offspring of Afro-Caribbean music, all these genres have a certain off-mainstream appeal in common. Techno/hardhouse music can be characterized as fast and minimalist, due to a monotonous bass beat, few, if any lyrics, and an exclusively electronic sound. It is at the extreme of loud and energetic dance music, typically favored more by males. Punk/hardcore is a loud and oppositional form of rock music, sometimes with a heavy politically radical touch, yet it also appears in a somewhat polished version in the charts, and even there remains oppositional, at least in image. Reggae has historically been associated with Jamaican social-

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religious opposition, but has been popularized worldwide. The term reggae hints at a subculture, known for glorifying marijuana as a means to gaining ‘knowledge’. Overall, it seems that genres with non-mainstream, youth-oriented pop appeal attract listeners who are also more likely to consider behaviours such as smoking and drinking “cool” (Spijkerman, van den Eijnden & Engels, 2005), while liking for music that is either mainstream (pop), or adult-oriented (classical music) seems to buffer tobacco and alcohol use. Personal characteristics such as rebelliousness, recklessness or sensation seeking may be the basis for both the attraction to non-mainstream music, and smoking and drinking. As personality factors were not included in our study we were unable to test the hypothesis that these associations were further explained by a characteristic such as recklessness, rebelliousness or sensation seeking.

Surprisingly, the genres most conspicuous in the previous literature, i.e. heavy metal and rap/hip hop were not of marked importance here. Though rap/hip hop was linked to more tobacco use among girls, it was negatively associated with alcohol use among boys, and heavy metal also predicted smoking and drinking negatively for boys and girls, respectively. This may hint at cross-national differences in the association between substance use and music, or may reflect an international tendency towards the ‘softening’ of metal and rap and the advent of other ‘non-mainstream’, ‘defiant’, ‘rebellious’ genres. Across Europe one type of heavy metal music has gained immense popularity. With the ascent of gothic rock in the late nineties, musically solidly founded in male oriented metal, but with mostly female singers, and including fairy tale images and occult symbols of a vaguely medieval nature, metal has gained a large fan base among females and has increasingly appeared in the charts. In Europe metal may have lost some of its rebellious status and may therefore be a less likely music choice for adolescents who want to use their music or substance use as markers of independence. In our study, liking heavy metal was associated with less substance use for both boys and girls. Rap/hip hop also appears to have lost its hardcore, oppositional nature since its massive popularization, and seems to be less related to deviant behaviours and substance use than it was during the 1990's. We found that only for girls a preference for rap/hop hop is positively associated with more tobacco use, for boys liking this genre is negatively linked to alcohol use.

This study hints at the emergence of cross-cultural or historical changes in the types of music that adolescents perceive as non-mainstream and therefore newer forms of association between music, and tobacco and alcohol use. While heavy metal and (gangsta)rap prevailed in

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the eighties and nineties, since then preference for other non-mainstream music has (also) become more prominently associated with substance use, punk/hardcore, techno and reggae (see also, (Chen, M.J. et al., 2006) while appreciating other musical genres marks lower substance use, pop, classical music.

Limitation and conclusions

A first limitation of this study is that it relies on self-reports. Adolescents may give a biased account of their smoking and drinking as their recall of last month use is not exact, or they may not want to respond to questions about unhealthy or illegal behaviour. However, questionnaires were administered in classrooms and it was clear that anonymity was assured and this procedure may help to generate reliable and valid data (Smit, De Zwart, Spruit, Monshouwer & Van Ameijden, 2002). Second, limited measures of music preference were used; we did not account for the listening frequency to different types of music, nor address their lyrical content. Whereas music taste is possibly best conceptualized as a patterning of different choices, we relied on the analysis of single variables. Third, potential other important factors for adolescent substance use, related to music preference, such as personality characteristics (e.g. rebelliousness, recklessness, sensation seeking (Arnett, 1991b, 1991c; Chen, M.J. et al., 2006)), social factors (social alienation (Roe, 1995)) or media influences (artists, lyrics and music videos as modelling agents, (e.g., Brown & Witherspoon, 2002; Robinson, Chen & Killen, 1998; Wakefield, Flay, Nichter & Giovino, 2003) have not been included in the design of this study. That leaves the possibility that the relationships that were found can be explained in more detail by third variables that have been omitted. Finally, this study has a cross-sectional design; therefore inferences on causal relationships cannot be made.

In the modelling of adolescent substance use, peer use is a major factor (Petraitis et al., 1995). Since friends are likely to share both music taste and substance use behaviours, it would be interesting to model the structural relationships between these factors into more detail. Both music choice and substance use may drive the choice of friends, and as entwined factors music preference and peer substance use may influence the initiation or continuation of tobacco and alcohol use in a group that just has started experimenting with substances that may cause serious health problems. Moreover, longitudinal cross-national monitoring of music preferences, their associations with different types of substance use and the patterning of peer

use would allow further insight into the role of music preference in the onset and continuation of substance use across cultures. As music is a pivotal element of adolescent culture, the study of music's function in relation to (peer) substance use seems timely. Most important, future studies should try to uncover *why* some types of music may mitigate substance use while other propagate it.

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STUDY 3

Is it the music? Peer use mediates the link between music preferences and adolescent substance use

Based on: Mulder, J., Ter Bogt, T.F.M., Raaijmakers, Q.A.W. & Nic Gabhainn, S. (submitted). Is it the music? Peer use mediates the link between music preferences and adolescent substance use.

Abstract

As part of a nationally representative study of 12 -16 year olds, 7 324 Dutch school-going adolescents provided data on music preferences, substance use behaviors and perceived number of peers using substances. Factor analyses showed that preferences for eight music genres factored into four styles: Pop (chart music, Dutch pop), Adult (classical music, jazz), Urban (rap/hiphop, soul/R&B) and Hard (punk/hardcore, techno/hardhouse); substance use was indicated by smoking, drinking, and cannabis use. Structural equation modeling revealed that the relationship between music preference and substance use was either wholly or partially mediated by perceived peer use. Preferences for Pop and Adult styles were associated negatively with substance use, both directly and through peer use. Liking Hard (directly) and Urban (through peer mediation) were linked positively with use. Music can model substance use and fans of different types of music may select friends with use patterns that reinforce their own substance use inclinations.

Introduction

Both music preferences (Arnett, 1991; Forsyth, Barnard, & McKeganey, 1997; Miranda & Claes, 2004) and peer substance use (Petraitis, Flay, & Miller, 1995; Simons-Morton, Chen, Abrams, & Haynie, 2004; Ter Bogt, Schmid, Nic Gabhainn, Fotiou, & Vollebergh, 2006) have been consistently associated with adolescent substance use. In addition, it is clear that music is an important socializing agent (Knobloch, Vorderer, & Zillmann, 2000; Lull, 1985; North, Hargreaves, & O'Neill, 2000; Rentfrow & Gosling, 2006), and thus both music preferences and substance use behaviors are shared among friends. Questions remain as to the nature of the relationship between music preferences, substance use and peer use. This study extends previous research by simultaneously modeling these three components. It aimed at disentangling the extent to which the link between music preferences and substance use can be explained by co-occurring peer use. Second, as yet, only a limited number of music genres have been investigated, mostly so among relatively small samples of young people. In this study the connection between music and substance use is investigated for a wide range of music types, among a nationally representative sample of Dutch adolescents.

Liking loud and energetic types of music, such as the harder forms of rock, rap, and dance music, has been shown to co-occur with increased levels of alcohol, cannabis, and tobacco consumption (Arnett, 1991; Forsyth et al., 1997; Miranda & Claes, 2004), compared to liking softer, more melodic and thus more easily accessible music. These relationships have been found across countries and population groups; for example tobacco, alcohol and cannabis use have been associated with heavy metal in the US (Arnett, 1991), in Canada (Lacourse, Claes, & Villeneuve, 2000), and Australia (Martin, Clarke, & Pearce, 1993), with rap/hip-hop in Canada (Miranda & Claes, 2004), and rave in Scotland, UK (Forsyth et al., 1997), and both Dutch and Californian dance-party fans are more likely to have used alcohol, cannabis and other club-drugs such as MDMA (Chen, Miller, Grube, & Waiters, 2006; Ter Bogt & Engels, 2005). Overall, previous studies have reported higher levels of substance use among listeners of more conspicuous, 'louder' music genres compared to listeners of gentler, more melodic music.

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Why is music associated with substance use?

The explanation of this link between music preference and substance use behaviors is still a matter of debate, and both social learning and self-matching selection hypotheses have been offered. In line with social-cognitive learning theory, both the behavior and lyrics of admired artists may have a modeling effect through mentioning, using or even celebrating smoking and alcohol use as desirable behaviors (Brown & Witherspoon, 2002; Gruber, Thau, Hill, Fisher, & Grube, 2005; Herd, 2005; Robinson, Chen, & Killen, 1998; Wingood et al., 2003), thereby constituting both a potential risk or protective factor, depending on expressed values (Giles & Maltby, 2004; Harakeh, Scholte, Vermulst, de Vries, & Engels, 2004; Maxwell, 2002; Petraitis et al., 1995).

An alternative suite of explanations focus on personality factors hypothesized to underpin both music preference and substance use behaviors (Carpentier, Knobloch, & Zillmann, 2003; Dollinger, 1993; Hansen & Hansen, 1991). Traits such as rebelliousness (Carpentier et al., 2003) and sensation seeking (Litle & Zuckerman, 1986; McCown, 1997; Zuckerman, 1994) may help explain the association between preferences for louder, more conspicuous forms of music and risk-taking behaviors such as substance use. However, although Chen et al. (2006) controlled for sensation seeking, the associations between music preference and substance use remained significant.

From a psychosocial perspective (Miranda & Claes, 2004) it is assumed that adolescents prefer the music that resonates with their own behaviors and perceptions; that is reflective of their ‘psychosocial realities’ (Arnett, 1996; Roe, 1995). In this perspective, both the liking of music and the choice of consuming or refraining from tobacco, alcohol and cannabis use is part of a broader lifestyle. Adolescents may also choose friends that fit into their lifestyle, and these friends may either enhance or discourage substance use. Music preference can be predictive of friendship formation (Knobloch et al., 2000; Selfhout, Branje, Ter Bogt, & Meeus, *in press*), implying that music is a key element of peer culture, and peer culture, in turn, may drive substance use.

The present study

This study aimed at extending this previous work by modeling a potential mechanism underlying the association between music preferences, self-reported substance use and the

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perceived substance use by peers, and poses the question whether, and if so to what extent, perceived peer substance use mediates the relationship between music preference and own substance use.

Over the past decades, factor analytical research on the structure of people's music preferences has shown that underneath a variety of genre preferences a distinct number of styles (factors) can be discriminated. Consistent styles have included guitar-driven Rock (containing genres such as hard rock & punk), electronic Dance (comprising genres such as trance, techno), Afro-American influenced style called Urban (e.g., soul, R&B, rap/hip hop), high(er)-culture style of music (e.g., classical music and jazz), and an easy to listen to, easily accessible Pop style, such as can be found in the Charts (Christenson & Peterson, 1988; Delsing, Ter Bogt, Engels, & Meeus, *in press*; Rentfrow & Gosling, 2003; Roe, 1985; Stevens, 2001; Tillekens, 1993). Results of a recent study (Mulder et al., *in press*) indicated that, although punk is close to rock music and techno and hardhouse are, musically, types of dance music, both genres can also be qualified as loud, non-mainstream music. In this study the loudest forms of Rock and Dance music are collapsed into a single factor: Hard music. Hence, four types of music styles that are well-known and wholeheartedly embraced or passionately disliked among Dutch adolescents are the subject of this study: Rock, Hard, Adult-oriented (jazz and classical music) and Urban music.

Although tobacco, alcohol and cannabis use are obviously distinct substance use behaviors, they do cluster together (Duncan, Duncan, & Hops, 1998; Johnston, O' Malley, & Bachman, 2002) and are related to similar outcomes (Riala, Hakko, Isohanni, Jarvelin, & Rasanen, 2004). Moreover, all three are mentioned quite frequently in popular music, especially in the popular genre rap/hip hop (Herd, 2005; Roberts, Christenson, Henriksen, & Bandy, 2002; Roberts, Henriksen, & Christenson, 1999). Therefore, the three types of substance use were modeled together in this study.

In sum: this study aimed at modeling substance use as connected to four distinct types of music preferences, with peer substance use potentially mediating this relationship (See figure 1).

Method

Sample

The data were derived from the 2003 Dutch National School Survey on Substance Use (DNSSSU), a cross-sectional study conducted every 4 years since 1984, which is supported by the Dutch Ministry of Health, Welfare and Sport. The sample was obtained by using a two-stage random sampling procedure from all secondary schools in the Netherlands. Schools were stratified according to level of urbanization and drawn proportionally to their number in the corresponding urbanization level. Within each school, a maximum of five classes (depending on school size) were randomly selected. The 10, 11, 17 and 18 year olds were excluded, because at these ages school students are not representative for the Dutch adolescent population. Part of the 10 and 11 year olds are still attending primary education and part of the 17 and 18 year olds have already left school (in the Netherlands school is compulsory up to age 16). The resulting sample comprised 7,324 students (mean age 13.91 years). The school response rate was 72% (192 out of 268 schools). Non-response mainly had to do with participation in other research (65%). Responding and non-responding schools did not differ on urbanization level or school size. Within classes an average of 7% of the students were not included, primarily due to illness. Parents were informed of the topic of the study and were free to indicate whether they did not want their children to participate in this study by returning a letter or an e-mail (passive consent). No parent objected to having his/her child interviewed.

Data collection

The DNSSSU is a survey that targets substance use and its correlates among adolescents in the Netherlands. The question format is derived from other large scale investigations into substance use such as the European Schools Project on Alcohol and Drugs (Europe), the WHO Health Behaviour in School-aged Children study (Europe and US) and Monitoring the Future (US). Student data were collected by questionnaire, administered in regular classes by trained assistants. These assistants briefly introduced themselves and the study, and asked the students to answer the questions as best as they could. They stressed the anonymity of the process. Questionnaires did not ask for the names of students. After students completed the questionnaires, these were collected, and put into an envelope that was sealed in

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front of their eyes. Teachers were asked to either leave or take a place at the back of the classroom.

Measures

Music preference was assessed by presenting eight music genres that students rated on 5-point scales ranging from 1 ‘dislike strongly’ to 5 ‘like very much’. The genres were representative of those readily available to Dutch youth (Mulder, Bogt, Raaijmakers, & Vollebergh, 2007; Ter Bogt, Raaijmakers, Vollebergh, Van Wel, & Sikkema, 2003); chart-based music, Dutch pop, rap/hip-hop, soul/R&B, punk/hardcore, techno/hardhouse, jazz and classical music.

Perceived peer substance use was assessed by asking “how many of the boys and girls you hang out with do the following things”; which was answered for smoking cigarettes, drinking alcohol, and using cannabis at least once a week on a five-point scale with the options ‘none’, ‘a few’, ‘half’, ‘most’, and ‘all’. For sake of brevity, this factor will be referred to as peer use in the Method and Results sections below.

Prevalence of cigarette smoking was assessed by asking students how often students smoked cigarettes, with the response options: ‘never’, ‘not in past 4 weeks’, ‘less than one a week’, ‘less than one a day’, ‘1-5 a day’, ‘6-10 a day’, ‘11-20 a day’, and ‘more than 20 a day’. This was measured on an eight point scale, with higher scores reflecting higher prevalences.

Past-month alcohol use and *Lifetime cannabis prevalence* were assessed by asking respondents to indicate the number of times they had used alcohol during the past month, and cannabis ever in their life, both with the response options ranging from 0 to 40 times or more. These were assessed on 14 point scales, with higher scores reflecting higher prevalences.

Preliminary analysis

The first step in model development was testing of the separate components. Exploratory factor analysis (EFA) using unweighted least squares (ULS) extraction with direct oblimin rotation was employed. The latter procedure takes relatedness of the scores into account, while the more commonly used method Principal Components Analysis with Varimax Rotation assumes independence of identified components. Eigenvalues had to be larger than one.

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The EFA of the music preference ratings indicated four latent music preference factors with two indicators in each factor. The reduction to four factors explains 64.48% of the variance in preference scores, and is similar to the structure identified in previous research (Christenson & Peterson, 1988; Stevens, 2001; Ter Bogt et al., 2003; Tillekens, 1993). Factor loadings of the supposed dimensions varied between 0.45 and 0.94. Following this, preference ratings of techno/hardhouse and punk/hardcore were modeled as having one underlying, latent variable named Hard, and preferences for chart-based and Dutch pop music functioned as indicators of Pop. Urban was represented by ratings of rap/hip hop and soul/R&B. Preference for jazz and classical music served as indicators for the construct Adult-oriented music

Based on previous reports in the literature (Bailey, Hill, Oesterle, & Hawkins, 2006; Hansen et al., 1987; Li, Pentz, & Chou, 2002), self-reported use of tobacco, alcohol and marijuana and perceived number of peers using these substances were each considered to represent a single underlying substance use construct. The EFA on these substance use measures showed factor loadings varying between 0.48 and 0.86. The reduction to latent constructs explained 47.7% of the variance in self-reported substance use, and 55.1% of perceived number of peers using the same substances.

Analysis

Structural equation modeling (SEM-modeling, in AMOS 7.0.0), Maximum Likelihood estimation was employed. Mediation requires significant relationships among all three components of the model (Baron & Kenny, 1986), i.e., music ratings, self-reported substance use, and peer use. The Sobel test was used to test the statistical significance of a possible mediation effect. The potential moderation of the relationships between components by gender and age group was investigated in multi-group analyses.

Results

The most popular genres were chart-based, Dutch pop music, rap/hip hop and soul/R&B, which were rated positively by most respondents. Punk/hardcore and techno/hardhouse were rated more negatively. The sample mean was below the neutral midpoint of the five point-Likert type scale. Jazz and classical music were least popular.

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Substance use prevalences in this sample were as follows: 33.5% had smoked cigarettes, 57.8% had used alcohol in the last month, and 15.9% had used cannabis. Perceived number of peers using substances, with the categories most and all taken together, was reported at 17.9% for cigarettes, 33.9% for alcohol and 5.1% for cannabis.

The three relationships of the model were first modeled separately as a prerequisite for modeling mediation effects (c.f. Baron & Kenny, 1986). Table 1 displays the standardized beta coefficients of the separate models for music preference and self-reported substance use, and the model for music preference and perceived number of peers using. The strong positive relationship between perceived number of peers using substances and self-reported substance use is shown below in Figure 1. In addition, testing of the hypothesized mediation effects using the Sobel Test indicated significant effects, with Sobel’s z-values ranging from -10.54 to 10.84 ($p < 0.001$). The R^2 for self-reported substance use is large (0.55), with both peers’ substance use and music preferences contributing significantly.

Fit estimates for the initial overall model indicated a nearly adequate model fit (Byrne, 2001) with $\chi^2(64) = 3,749.35$, CFI = .901, RMSEA = .089, and $.086 \leq 90\% \text{ CI} \leq .091$. However, a measurement model with adequate fit is a prerequisite for testing structural relationships. Thus variances of the indicators of the two latent constructs own and peers’

Table 1

Summary of two separate models: standardized regression weights of music preferences on substance use and on peer use

	Music → own use ^a	Music → peer use ^b
Pop	-.28	-.15
Adult	-.17	-.10
Urban	.25	.17
Hard	.17	.12

Note: All β -coefficients significant at $p < 0.01$.

^a Model fit indices for this model are $\chi^2(37) = 1,088.50$, $p < 0.01$ CFI = .959, RMSEA = .062, with $.059 \leq 90\% \text{ CI} \leq .066$.

^b Model fit indices for this model are $\chi^2(37) = 1,151.03$, $p < 0.01$ CFI = .954, RMSEA = .064, with $.061 \leq 90\% \text{ CI} \leq .067$.

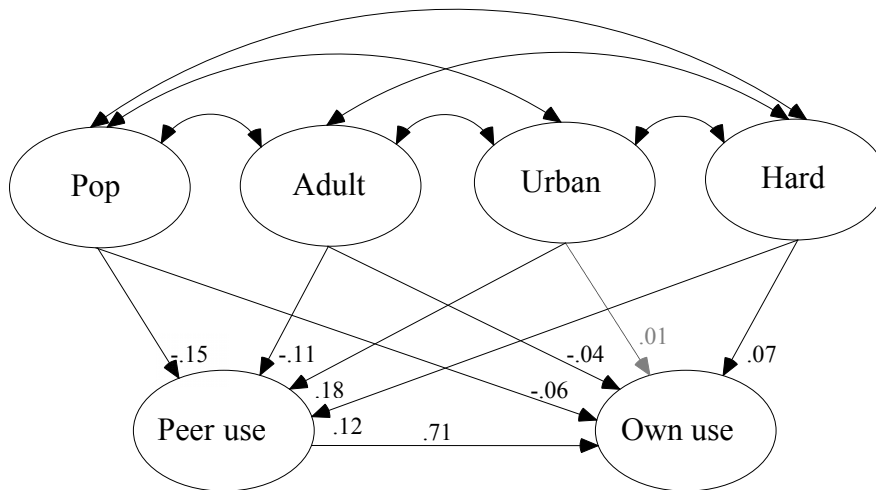
substance use were allowed to correlate, since these correlations reflect correlated measurement error for identical measures. Consequently, the errors of the indicators own and peers’ cigarette use, own and peers’ alcohol use and own and peers’ cannabis use were allowed to correlate.

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Subsequently, model fit improved to adequate, i.e. $\chi^2(62) = 1,409.09$, CFI = .962, RMSEA = .056, with $.054 \leq 90\% \text{ CI} \leq .059$. Figure 1 displays the final model.

Figure 1

Music taste, self-reported substance use, and the mediator peer use



Note: The model depicts the standardized β -coefficients indicating peers' and own use, and covariances between music preference factors. For sake of clarity, the indicators of the latent factors and their estimated error variances are not depicted. Model fit indices: $\chi^2(62) = 1,409.09$, $p < 0.01$ CFI = .962, RMSEA = .056, with $.054 \leq 90\% \text{ CI} \leq .059$.

Figure 1 depicts the standardized beta coefficients, and table 2 displays the direct, indirect, and total effects based on these standardized beta-coefficients. Preference for music styles is differentially associated with own or peer use (β s vary between -0.15 and 0.18). Comparison of total versus indirect effect values indicates the substantive importance of the mediation mechanism, as well as the importance of the additional direct link.

The estimate of the path coefficient for peer onto own substance use is positive ($\beta = 0.71$). Preference for the Urban style is only positively associated with peer substance use, i.e. mediation is complete here ($\beta = 0.18$). Preference for the Hard music is positively associated with both peer and self-reported substance use (standardized β s are 0.12 & 0.07, respectively). Preferences for Pop and Adult-oriented music are negatively associated with both peer and self-reported substance use (respective β s Pop; -0.15 & -0.06; Adult: -0.11 & -0.04).

Comparing the total and indirect effect values of music preference on self-reported substance

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use illustrates that the associations between liking of Pop, Hard, and Adult music and own self-reported substance use are substantially mediated by peer substance use.

Table 2

Total, direct and indirect effects of components on self-reported substance use with peer use in the mediation model

	Effect values		
	Total	Direct	Indirect
Pop	-.17	-.06	-.11
Adult	-.12	-.04	-.08
Urban	.14	.01	.13
Hard	.16	.07	.09

Note: All effects significant at $p < 0.01$, with the exception of the non-significant direct path from Urban preference to self-reported substance use in the full model.

^a Unstandardized effect values.

The potential moderation of the relationships between components by gender and age was investigated in multi-group analyses, but were neither consistent nor substantial.

Discussion

This study aimed at extending previous work by modeling the structure of a hypothesized mechanism underlying the association between music preferences, self-reported substance use, and the role of perceived number of peers using substances. The hypothesized mediation mechanisms were confirmed. The substance use risks associated with preference for Urban music (soul/R&B, rap/hip-hop) were entirely mediated by perceived peer substance use. Preferences for other styles of music were indicative of both personal substance use behaviors, and the perceived substance use behaviors of peers. That is, ratings of the music style labeled Hard were also positively associated with substance use, but the hypothesized mediation was partial here; both self-reported substance use and perceived numbers of peers using substances were relevant. Preferring Adult-oriented music (jazz and classical) and Pop (chart-based and Dutch pop) functioned as protective factors, both directly and indirectly. The modeled relationships were similar for groups based on gender and age.

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The modeled mediation

The ratings of four distinct styles related to both self-reported substance use and perceived number of peers using substances. The negative relationships between self-reported substance use and liking of Pop and Adult-oriented music suggests that adolescents who prefer these styles report less substance use, and are less likely to perceive their friends as using substances, which in turn has an attenuating effect on substance use of the adolescents themselves. In the case of preferences for Urban and Hard music styles, the mediation mechanism seems to function in the following way; adolescents liking these types of music are more likely to use substances, and are more likely to perceive their friends as doing the same, which in turn is positively associated with adolescent substance use (Aseltine, 1995; Kandel, 1996). Interestingly, in contrast to ratings of Hard music, those of Urban were no longer associated directly with self-reported substance use, but were entirely mediated by perceived peer substance use. Taken together, these mediation effects suggest music preference could be conceptualized as an organizing principle in the social stratification of substance use patterns among adolescents.

The associations between music preferences and perceived peer use may be explained by viewing music preferences as both defining and shaping elements of the cultural options adolescents have, with each option associated with aspects of lifestyle, for example appearance and leisure time activities (Golub, Johnson, & Dunlap, 2005). Consideration of these issues may be employed as a basis for friendship selection, as well as for defining in- and out-group boundaries (Knobloch et al., 2000; North et al., 2000; Rentfrow & Gosling, 2006). The associations between adolescents' own music preferences on the one hand, and peers' substance use on the other, favor the interpretation that music preference serves a "badge" function with implications for lifestyle (Frith, 1996; North et al., 2000; Rentfrow & Gosling, 2006), i.e. that selection of musical genres facilitates other-directed identity claims, which also have implications for health risk behaviors such as substance use.

The lifestyle implications are derived from the specific culture surrounding and defining a music style. Important in the relationship with substance use behaviors is the oppositional attitude inherent in the music. For instance, liking the style labeled Hard entails both techno/hardhouse, which is very much part of a culture of partying, of going out (Forsyth, 1996), and punk/hardcore, which appears to have replaced the position that heavy metal used to

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have in research on youth and deviant behaviors. This music can be characterized as loud, energetic guitar music, and is oppositional to adult authority, at least in image. Considering the potential of substance use to be used by adolescents as a means to defy adult authority could well explain the association with music such as punk/hardcore and techno/hardhouse (Spijkerman, van den Eijnden, & Engels, 2005). Therefore, preference for music that is youth-cultural in orientation as opposed to adult-oriented is likely to be a marker of risk-behaviors such as substance use, both personally as well as through peers.

The positive association between liking Urban music and substance use can be explained by previous studies which focused on one of the indicators linked to the supposed Urban music construct, that is, rap/hip hop. Rap/hip hop has been linked consistently to alcohol, cigarette and cannabis use both in terms of video and lyrical content (Herd, 2005; Roberts et al., 2002; Roberts et al., 1999), as well as through associations with preferences for, especially, harder and less mainstream forms of rap/hip hop (Miranda & Claes, 2004). The substance use favoring content of rap/hip hop's videos and lyrics help explain its appeal as a non-adult-oriented type of music with associated lifestyle.

The remaining direct associations between music preference and substance use call for an additional explanatory concept. Both music taste and substance use have been linked to the personality construct called sensation seeking (Arnett, 1991; Chen et al., 2006; Zuckerman, 1994). Liking for loud and hard music can be viewed as stemming from a need for experiencing intense sensations. This need can similarly become expressed in an inclination to engage in risky, reckless behaviors including substance use (Arnett, 1992, 1995). The negative associations between liking for Adult-oriented and Pop music on the one hand, and substance use on the other, can be viewed as arising from a low level of the sensations seeking disposition. The relevance of Urban music was entirely explained by peer behavior, but the positive direct association between liking Hard music and substance use can similarly be viewed as arising from a disposition to seek intense stimulations.

This study's contribution lies in the modeling of a mechanism operating in the link between music preference and adolescent substance use. At least part of this link can be explained in terms of behavioral similarity among friends, but there is also a direct effect. Unfortunately, we could not determine whether or not this effect reflects a disposition to seek intense experiences, which pertains to choices such as music preferences and behaviors such as

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substance use. An alternative explanation could be that music listening, music video watching, and behaviors of artists as told in the press influence adolescents to engage in risky behaviors such as substance use. The reported associations could also arise from an interaction between disposition and social learning from lyrics, videos, and artists. To further elucidate mechanisms of self-matching selection and social learning, additional information such as importance of music, time spent listening and degree of identification with artists and their music would help in providing a more comprehensive picture.

The role of peers can similarly be conceived of as entailing selection, social learning, or both. Literature on peer groups and peer pressure (Brown, 1990) suggests that these associations probably reflect both selection effects, i.e. individuals select peers to befriend based on shared characteristics such as music taste (Selfhout, Branje, Ter Bogt, & Meeus, 2007) and substance use (Simons-Morton et al., 2004), as well as social learning, i.e. copying of behavior (Aseltine, 1995). As our study was exploratory in nature and did not entail a sketch of the longitudinal trajectory of music taste and substance use development it is impossible to reach any further conclusions on the nature and timing of these associations.

Further limitations must be noted. Although the coefficients between music taste and substance use were substantial and significant (varied between $-.17$ and $.16$), further disentangling of the role of peers and music taste is needed. Additional information is needed to help explain why the reported mediation effects were complete in the case of Urban preferences, as opposed to the partial mediation effects regarding the other types of music preferences. For instance, more precisely defined peer clique associations and the social identities and leisure activities associated with these (Eccles, Barber, Stone, & Hunt, 2003; Mahoney & Stattin, 2000) should be included in future studies relating music tastes to peer behavior.

In line with the selection position, the personality construct sensation seeking should be included in future studies, as this personal disposition is related to both music taste and health risks such as substance use (Arnett, 1991; Bradley, 2002; Chen et al., 2006). Other factors not included, but also known to be important in substance use studies include genetic predisposition (Hopfer, Stallings, Hewitt, & Crowley, 2003) and the larger social environment beyond peers and music preferences, such as national policies and campaigns (Arnett, 1992). For adolescents, parenting practices and the quality of the relationships with peers, classmates

and parents (Aseltine, 1995; Kandel, 1996; Simons-Morton et al., 2004) are known to be important in explaining adolescent substance use. Future research enabling simultaneous testing of these inter-related factors over time is much needed.

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STUDY 4

Music taste groups and psychosocial functioning among adolescents

Based on: Mulder, J., Ter Bogt, T.F.M., Raaijmakers, Q.A.W. & Vollebergh, W.A.M. (2007). Music taste groups and problem behavior. *Journal of Youth and Adolescence*, 36 (3), 313-324.

Abstract

Internalizing and externalizing problems differ by musical tastes. A high school-based sample of 4159 adolescents, representative of Dutch youth aged 12 to 16, reported on their personal and social characteristics, music preferences and social-psychological functioning, measured with the Youth Self-Report (YSR). Cluster analysis on their music preferences revealed six taste groups: *Middle-of-the-road (MOR)* listeners, *Urban* fans, *Exclusive Rock* fans, *Rock-Pop* fans, *Elitists*, and *Omnivores*. A seventh group of musically *Low-Involved* youth was added. Multivariate analyses revealed that when gender, age, parenting, school, and peer variables were controlled, *Omnivores* and fans within the *Exclusive Rock* groups showed relatively high scores on internalizing YSR measures, and social, thought and attention problems. *Omnivores*, *Exclusive Rock*, *Rock-Pop* and *Urban* fans reported more externalizing problem behavior. Belonging to the *MOR* group that highly appreciates the most popular, chart based pop music appears to buffer problem behavior. Music taste group membership uniquely explains variance in both internalizing and externalizing problem behavior.

Introduction

Pop music is an important medium for young people and music plays a central, often binding role in youth cultures (Zillmann & Gan, 1997; Ter Bogt, 1997). Though pop music is highly valued by most adolescents (North, Hargreaves & O'Neill, 2000), some adult observers consider particular genres of music potentially dangerous to young people, as the music and its performers are perceived as glorifying and propagating adolescent substance use, transgressive behavior or even delinquency (Christenson & Roberts, 1998). Certain genres, for example, heavy metal and rap/hip-hop, have a particularly negative image, especially in the media (Binder, 1993; Fried, 2003). This has led researchers to compare youngsters liking 'deviant' music types with youngsters liking 'mainstream', i.e., socially acceptable types of music, on several assessments of emotional and/or behavioral problems (Arnett, 1991, 1996; Lacourse, Claes & Villeneuve, 2001; Martin, Clarke & Pearce, 1993; Miranda & Claes, 2004; Roe, 1995; Scheel & Westveld, 1999). In this article we make finer distinctions between adolescent music taste groups and reach beyond the simple dichotomy of 'mainstream' versus 'deviant' music preferences. We have examined to what degree seven distinct taste groups differ with regards to adolescent emotional and behavioral problems.

Achenbach (1991) has conceptualized adolescent emotional and behavioral problems as internalizing and externalizing problem behavior. These two forms of problem behavior covary to some extent, however several studies have demonstrated convincingly that internalizing and externalizing problems are two conceptually and empirically discreet aspects of problem behavior (e.g. Loeber, Farrington, Stouthamer-Loeber & Van Kammen, 1998), and Achenbach's distinction has been used as a model for numerous studies on problem behavior in the nineties (Steinberg & Morris, 2001). Achenbach's Youth Self-Report (YSR), the survey designed to assess adolescent problem behavior, contains items on both Internalizing Problems (somatic complaints, symptoms of anxiety and depression, and withdrawn behaviors) and Externalizing Problems (aggressive and delinquent behaviors, and substance abuse) next to measures of social, attention and thought problems. The seven taste groups that were subject of our research were compared on all these types of problem behavior

Previous studies have addressed the link between a preference for deviant genres such as heavy metal and rap/hip hop, and internalizing distress. Martin, Clarke and Pearce (1993)

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used the YSR to compare fans of heavy metal music with those liking less hash pop music. For both boys and girls significant associations appeared to exist between a preference for rock/metal music and suicidal thoughts, acts of deliberate self-harm and depression, however especially the (small) group of girls who favored this loud, guitar driven music seemed to face problems more often. Stack, Gundlach & Reeves (1994) have stated that heavy metal music reflects and possibly nurtures suicidogenic alienation, despair, and hopelessness among metal fans. Scheel (1995) concluded that adolescent heavy metal fans have higher than average rates of depression and low self-esteem, and Scheel and Westefeld (1999) reported that both female and male metal fans showed higher levels of suicide ideation than their mainstream peers, with, again, girls showing more problems than boys. In a Canadian sample Lacourse et al. (2001) found that boys preferring metal music did not differ from their peers in feelings of alienation, anomie, nor did they differ in suicidal risk. However, girls liking heavy metal reported more feelings of alienation and anomie, and seemed to be at a higher risk for suicide. Together these results seem to imply that a preference for heavy metal is linked to more internalizing distress, but that liking metal music has more negative consequences for girls than for boys.

Externalizing problem behaviors have also been associated with music preferences. A number of studies have shown that adolescents preferring non-mainstream music types engage in more rule-violating and risky behaviors than their mainstream-oriented peers. A preference for heavy metal, a predominantly white, working class genre in the USA- has been linked to reckless behavior: drunk driving, speeding, elevated use of alcohol, cannabis and hard drugs, risky sexual behavior (Arnett, 1991; Martin et al., 1993). Scheel (1995) concluded that metal fans appear to vary (in a uniformly negative direction) from the general adolescent population on delinquency, recklessness, strained family relationships and greater school-related problems. Some authors have observed that metal video fans foster more aggressive thoughts and feeling (Anderson, Carnagey & Eubanks, 2003) and find sexist behavior and violence acceptable more easily than their (male) peers who dislike the genre (Hansen, 1989; Hansen & Hansen, 1990). Carpentier, Knoblauch and Zillmann (2003) found an association between a liking of both metal and rap songs with socially deviant lyrics and edgy rhythms, and overall trait rebelliousness. Miranda & Claes (2004) studied the association between a preference for different types of rap music and deviant behaviors (e.g., street gang involvement, theft and drug use) in a Canadian sample. Overall, like metal, loud and brash forms of rap are a predominantly

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male choice of music and a preference for these types of music is linked to externalizing problems. The nature of the relationship differed according to specific rap genres. French-Canadian rap was associated with more violence, street gang involvement and drug use, and subgenre preference for gangstarap held a relationship with more thefts. Hip-hop/soul fans and American rap fans (to youth in Quebec a commercialized rap genres) committed fewer thefts and the first group scored relatively low on drug use, indicating that subtle within-genre differences may be important for the potential link between music and problem behavior. In sum, both ‘hardcore’ metal and rap fans -young people favoring the most deviant and noisiest types of metal and rap- seem prone to more externalizing problems.

Some of the studies reviewed here involved more than bivariate relations between music preference and internalizing and externalizing distress. As noticed, metal and rap fans may also be more likely to report unsupportive family relationships, and more often dislike or oppose basic social institutions like school, church, or society in general (e.g. Arnett; 1991,1996; Miranda & Claes, 2004; Weinstein, 1991). Deviant music fans’ social positioning may at least partially explain the link between their music preferences and their problems (Took & Weiss, 1994). For example, Lacourse et al. (2001) found that the correlation between a preference for heavy metal and suicidal risk disappears when controlling for other risk factors, i.e., feelings of alienation in terms of self-estrangement or powerlessness, and drug use. Contrary, Arnett (1991) and Miranda & Claes (2004) conclude that even when is controlled for a set of confounding factors -quality of family and peer relations, alienation, deviant behavior of peer group members- the relationship between music preference and (externalizing) problem behavior remains significant, implying that fandom of some types of music is a unique contributing factor for the explanation of adolescent distress.

In sum, a preference for ‘deviant’ forms of popular music has been linked to internalizing behavior and especially adolescent girls liking heavy metal may be at risk for elevated problems. For both boys and girls a link has been established between metal or hip hop preferences, and externalizing problem behavior. Some studies show that the association between music preference and internalizing distress may be spurious, as the link is attributable to concurrent feelings of helplessness and alienation from family or school, and drug use. Others have concluded that music preference uniquely contributes to the explanation of (at least) externalizing problems by showing a significant association even when confounders are

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included in the analysis. Together these studies may imply that externalizing problem behavior, more so than internalizing behavior is interwoven with deviant music choices and that music preference is a distinct operating factor for the emergence of this type of problems.

The present study

Most studies of the relationships between music preference and problem behavior have focused on non-mainstream music with a poor public reputation –heavy metal and rap/hip hop. The basic approach has been to compare problem behavior scores of adolescents with a preference for these deviant music styles to the scores of adolescents who like mainstream, i.e., socially acceptable music. However, this simple dichotomy does not reflect to the nature and structure of the pop music audience among adolescents. Pop music taste is far more than a single preference for one of these styles. Music taste amounts to an elaborate judgment of genres in terms of likes and dislikes, or neutrality, and audiences are segmented according to these judgments.

Using cluster analysis Ter Bogt, Raaijmakers, Vollebergh, Van Wel and Sikkema (2003) constructed a typology of the pop music audience by classifying respondents into groups of listeners. This approach to music taste preference constitutes a shift from a ‘variable-centered’ –single preference scores– to a ‘typological’ –taste group membership– approach (Mandara, 2003), and illustrates a move from a one-dimensional to a multidimensional and more conceptual classification (Bailey, 1994). In this study we use the same analytical tools to typify music taste groups and subsequently link taste group membership to adolescent adjustment.

In addition, previous studies have studied only small numbers of adolescents, and their samples were limited in representativity, i.e. drawing participants from one geographical area only. In this study, 4159 adolescents aged 12 to 16, and representative of the Netherlands, completed questionnaires, as part of the WHO Health Behavior of School-aged Children (HBSC) study, with items assessing socio-demographic profile, (dis)liking of a representative range of music genres (Ter Bogt, Van Dorsselaer & Vollebergh, 2003; Vollebergh, Van Dorsselaer, Monshouwer, Verdurmen & Ter Bogt, submitted), and social-psychological functioning by means of the Youth Self-Report (Achenbach, 1991).

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With this study we intend to sketch a more detailed picture of the structure of the music taste group field and we will try to examine the full front of music taste groups in relation to problem behavior. Exploring a new domain, using hitherto seldom used techniques of music preference classification and, in that way, moving away from variable centered models, we find it against the gist of this study to propose hypotheses on the music problem behavior link derived from studies addressing only one or two forms of (defiant) music preference against a backdrop of mainstream choice. The aims of this study then are, first, to identify types of pop music taste groups, and, second, assess differences in internalizing, externalizing, social, thought and attention problems between these groups, while controlling for relevant personal and background characteristics.

Method

Sample

In the HBSC study a two stage random sampling frame was used, that is described in the international protocol of the HBSC-study (2000). First, a random sample of secondary schools in the Netherlands was selected proportionally within urbanization strata. Response rate at school level was 45% (first four grades). This resulted in a school sample of 66 schools. Next, within schools a selection of classes of pupils was conducted. The schools provided a list of classes. Out of this list, one class per grade was selected at random for participation. Within classes, the response rate was 95%. This sampling strategy resulted in a representative sample of Dutch secondary school pupils aged 12 to 16.

The total number of participants in this study was 5695. However, in the multivariate GLM procedure testing differences in problem behavior, a total of 1536 participants were excluded from the analysis, due to missing values. Within the resulting sample (n=4159), the mean age was 13.96 (SD 1.29), and 51.5 % were female, 84.4% was of Dutch origin, 15,6% belonged to different ethnic minorities. The group of 1536 respondents excluded from the final analyses differed slightly from the analyzed sample, i.e. in the excluded group there were proportionately more boys, they were younger, and functioned academically at a somewhat lower level (all eta-squared <.02). However, they did not differ in terms of social support from

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parents and friends. Most importantly, they also did not differ in terms of the outcome measures.

Measures

Students were asked to report on their socio-demographic characteristics: *gender, age and educational level*. In the Netherlands Secondary education is subdivided into four different levels, each of which leads into a particular educational career or occupational opportunity. Educational level ranges from low to high on the following scale; 1= 'Vbo' (lower technical and vocational training), 2= 'Mavo' (lower intermediate level), 3= 'Havo' (higher intermediate level), and 4= 'Vwo' (Pre-university education). Perceived school achievement was measured on a four-point scale ranging from 1= 'less than average' to 4 = 'above average'.

Family wealth was assessed with the Family Affluence Scale (FAS), which was developed for and validated with adolescents (Currie, Elton, Todd, & Platt, 1997). As it is difficult to assess parental occupation or family income through children, in this measure the focus is on variation in income that is expressed in the consumption of material goods in the family. The FAS is conceptually related to common indices of material deprivation (Townsend, 1987) and is similar to an index of home affluence (Wardle, Robb & Johnson, 2002). The FAS consists of four questions reporting on the presence of material goods in the family: number of cars, pupil having a bedroom on his/her own, number of computers in the home, number of times the family goes on a holiday. The FAS has been validated in earlier research.

Support of parents (mother and father) and friends was assessed by three items of the HBSC-version of the role-relation-method (Fisher, 1982; Meeus, 1989). Children were asked to indicate on a 5-point scale the degree of support they received from reference persons (father, mother, best friend, respectively) when things bothered them. The question asked was: 'How easy is it for you to talk to the following persons about things that really bother you?', with the response categories 'very easy', 'easy', 'difficult', 'very difficult', or 'don't have or see this person'. Prior research using this scale has indicated good validity for these items (Vollebergh et al., submitted). The above variables are associated with both music preference and problem

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behavior and therefore represent confounds in the model (Ter Bogt, 2004a; Vollebergh et al., submitted).

Music preference was assessed using thirteen music genres that students could rate on 5-point scales ranging from ‘dislike strongly’ to ‘like very much’, and a separate option for ‘unfamiliar with’ (Ter Bogt et al, 2003). The presented genres were heavy metal, punk/hardcore/grunge, rock, gothic/wave, rap/hip-hop, soul/R&B, reggae, top40/ charts, Dutch pop, house/trance/techno, club/mellow, classical music and jazz. Missing scale item values were imputed using the relative means substitution approach developed by Raaijmakers (1999).

Table 1

Music styles: Factors representing music preferences

	I	II	III	IV
Genres	Rock	Urban	Pop-Dance	Elite
Heavy metal	.900	.018	-.022	-.014
Punk/Hardcore/Grunge	.874	.048	.065	-.031
Gothic	.837	.072	.084	.103
Rock	.771	.002	.085	.160
Rap/Hip-hop	.042	.834	.184	-.083
Soul/ R&B	-.119	.804	.271	.051
Reggae	.211	.732	-.027	.311
Club/ Mellow	.222	.168	.785	.061
House/Trance/ Techno	.152	.132	.784	-.167
Top40/Charts	-.143	.088	.753	.098
Classical music	.037	-.077	-.010	.884
Jazz	.140	.388	.025	.735

Note. Principal Component Analysis, Varimax rotation, with eigenvalues over 1 and 71.2 % variance explained.

Outcome measures

Problem behaviors were measured using the Youth Self-Report (Achenbach, 1991). The Youth Self-Report is designed to be completed by adolescents aged 11-18 years, and contains 101 problem items. Pupils are asked if they have experienced these problems in the preceding 6 months and the response options are ‘not present’, ‘somewhat or sometimes true’, or ‘very true or often true’. The Youth Self-Report provides the following eight subscales: withdrawn (Cronbach’s α in this research: .69), somatic complaints (α : .74), and anxious/depressed (α : .80) (these three subscales assess the wider construct ‘internalizing problems’), delinquent behavior (α : .70) and aggressive behavior (α : .83) (these scales assess ‘externalizing problems’), social problems (α : .60), thought problems (α : .62), and attention problems (α : .67) (these latter scales

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are not part of either the internalizing or externalizing scale). Originally, the reliability and validity of the Youth Self-Report scales have been documented by Achenbach (1991), these measures were translated and validated for the Netherlands by Verhulst, Van der Ende & Koot (1997).

Strategy for analysis

To operationalize the group of youngsters not or low-involved with music, we set as a minimum test of involvement: knowledge of at least two of the most well known main genres of (pop) music (Ter Bogt, 2004a). As test genres we used heavy metal, rap/hip hop, classical music, and chart-based music. Those participants indicating not knowing more than two of these, were grouped together and labeled musically ‘low-involved’. They were excluded from the subsequent factor and cluster analyses.

In order to create a musical taste group typology, first a factor analysis was conducted on the music genre ratings to reveal the underlying dimensions of music taste. A four-factor solution provided the best solution, with eigenvalues over 1 and 71.46 % variance explained (see table 1). The four extracted components comprised the musical styles of ‘Rock’ (heavy metal, punk/hardcore/grunge, rock and gothic), ‘Urban’ (hip hop, soul/ R&B), ‘Pop-Dance’ (charts, house/trance/techno and club/mellow house), and ‘Elite’ (classical music and jazz). This compares well to previous Dutch, Flemish and American research on the structure of music preferences using factor analysis or multi-dimensional scaling techniques (Christenson & Peterson, 1988; Tillekens; 1993, Stevens; 2001; Ter Bogt et al., 2003).

The average appreciation of the genres belonging to the four major musical styles, i.e. music style scores, were used as input for the cluster analysis in order to define taste groups that reflect the complexity of musical preference patterning. Finally, a MANOVA was employed to investigate whether the taste groups that resulted from cluster analysis, plus the low involved group, differed on YSR scores on internalizing, externalizing, social, thought and attention problems while controlling for the association of background characteristics and the quality of social relations. In order to compare our findings with those of an Australian high-school based study by Martin et al. (1993), also using Youth Self-Report, we ran an identical,

separate MANOVA with the items ‘deliberate self-harm’ and ‘suicidal thoughts’, taken out of the subscale anxious-depressed, as they did.

Results

Participants were grouped according to their relative attraction to and/or rejection of the four basic music styles: Rock, Urban, Pop-Dance and Elite. For this purpose several consecutive hierarchical cluster analyses were performed on the style scores, with each style score representing the individual participant’s overall evaluation of a specific musical style. In order to maximize within group similarity in taste, the method of clustering participants was based on intra-group similarity in the pattern of evaluation of the four musical styles, rather than between group differences in these evaluations.

Seven consecutive hierarchical, agglomerative cluster analyses were tested empirically using within-groups linkage based on squared Euclidean distance. Each cluster analysis differed in the number of clusters (or groups of participants) that were allowed to emerge, ranging from four to ten clusters. Criteria had to be formulated to determine which solution best fitted the data. This entailed testing the substantiality of the differences in explanatory power of potential cluster solutions, rather than differences in statistical significance between the seven cluster solutions (Cohen, 1988). The best possible cluster solution was chosen on the basis of employing a combination of five criteria. The solution should: optimally explain the overall variance of the four music styles (1); explain the univariate variance of the distinct styles (2); explain the variance in the patterning of individual style scores (3); be parsimonious (4) and well interpretable (5) (for a detailed description of this procedure: see Ter Bogt et al., 2003).

First, as a measure of general efficacy, the solution should explain at least 35 percent of the variance in musical style ratings. The chosen six cluster solution explained 39.6 % of the variance in music style preferences (Pillai’s $F(20, 17888) = 587.30, p < 0.001$). Second, partial eta-squared had to be at least 0.14 per style, so that each style separately was to a large extent explained by the cluster solution, as indicated by the univariate results. Eta-squared values ranged between 0.22 for Pop-Dance ($F(5, 4472) = 253.51, p < 0.001$), 0.46 for Urban ($F(5, 4472) = 747.54, p < 0.001$), 0.51 for Elite ($F(5, 4472) = 920.67, p < 0.001$) and 0.61 for Rock

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($F(5, 4472) = 1372.18, p < 0.001$) in the six cluster solution. Third, the amount of explained variance in the individual patterning of music style ratings should be as large as possible. This was checked in repeated measures MANOVA with the scores on the 4 styles used as dependent variables ($F(15, 13416) = 554.03, p < 0.001, \text{partial eta-squared} = 0.38$) for the six cluster solution), meaning that the pattern of the differences in appreciation of the styles is as consistent as possible with differences between styles maximal (the within-subjects factor had to be maximal). In addition, the solution had to be parsimonious, in the sense that greater number of clusters should imply only marginal improvements of the fit according to the three, previously mentioned, criteria, and it should be well interpretable (see also Ter Bogt et al., 2003).

According to these criteria a six cluster model was preferred as a parsimonious, well interpretable solution that showed an optimal fit to the music style data. Solutions with more clusters did not substantially improve the variances explained and resulted in the identification of hard to qualify clusters with small group sizes. Higher order solutions thus decreased the power of subsequent analyses to discern differences in problem behavior, and this counted as an additional argument to prefer the six cluster solution.

Table 2a shows the average appreciation of the four musical styles (Rock, Urban, Pop-Dance, Elite) by each cluster. The clusters were labeled according to their relative preference or dislike of these styles. The first music taste group does not show an overwhelming enthusiasm for music. Their scores for liking the most popular type of music, chart based Pop-Dance, are above the scale medium 3, indicating that they value this type of music somewhat positively, but they are not particularly fond of other types of music and because of their conventional mainstream taste this group was labeled *Middle-of-the-Road (MOR)*. The second group, *Urban* fans, show an exceptional interest for music in the Afro-American tradition of pop, nowadays called Urban. They are marked further by their distaste of Rock music, a predominantly white genre. Contrary, the small group of *Exclusive Rock* fans has a narrow admiration of metal and other loud music and these fans virtually dislike all other music. With their severe rejection of chart based music this is a truly non-mainstream group. The *Rock-Pop* group shows a far broader taste than the *Exclusive rockers*. They also like Rock music but appreciate Pop-Dance music as well, while scoring neutral on Urban music. The *Elitist* group stands out with their single preference of classical and jazz music. *Omnivores* rate the Elite genres even higher than

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the *Elitists* themselves, but this group is also marked by a general enthusiasm for all other styles of music. Table 2b displays the taste groups and their demographics.

Table 2a
Taste groups and their appreciation of music styles

	Rock	Urban	Dance	Elite	N
1. Middle of the Road	1.54 (0.55)	2.58 (0.83)	3.31 (0.81)	1.61 (0.62)	758
2. Afro-American	1.59 (0.56)	4.10 (0.53)	3.47 (0.87)	2.35 (0.72)	847
3. Exclusive Rock	3.92 (0.68)	1.93 (0.83)	1.58 (0.45)	1.24 (0.34)	78
4. Rock-pop	3.28 (0.75)	3.47 (0.75)	3.80 (0.74)	1.97 (0.66)	1358
5. Elitist	2.16 (0.60)	2.92 (0.57)	2.76 (0.59)	3.13 (0.59)	316
6. Omnivores	3.37 (0.87)	4.24 (0.57)	3.77 (0.74)	3.48 (0.58)	584
7. Low Involved					253
Overall	2.52 (1.10)	3.47 (0.94)	3.50 (0.88)	2.30 (0.93)	4194

Note. Music scores represent means (and standard deviations) on Likert-type scales ranging from 1 (dislike strongly) to 5 (like strongly).

Table 2b
Taste groups and their demographics

	%	% female	Age (SD)	School-level ¹
1. Middle of the Road	18.1	54.2	14.1 (1.26)	2.38
2. Afro-American	20.2	60.3	14.1 (1.27)	2.46
3. Exclusive Rock	1.9	35.9	14.3 (1.14)	2.47
4. Rock-pop	32.4	44.2	13.9 (1.23)	2.41
5. Elitist	7.5	62.7	13.8 (1.34)	2.79
6. Omnivores	13.9	49.5	13.9 (1.37)	2.50
7. Low Involved	6.0	47.8	13.6 (1.36)	2.00
Overall	100.0	51.5	14.0 (1.29)	2.43

¹ School level ranges from low to high, with values 1= Vbo (low); 2= Mavo; 3= Havo; 4= Vwo (high)(see text in the method section).

Taste Groups and Problem Behavior.

Results of the MANOVA with music taste group membership and confounders as independents and the range of YSR problem behavior assessments as dependents showed that, overall, music is a significant (Pillai's $F(48, 24774) = 6.51, p < 0.001$) and substantial (eta-squared = 0.01) factor associated with the range of problem behavior. Next, univariate tests of the link between music taste group membership and the separate problem behavior scales indicated that for all YSR assessments individually, group membership showed to be a significant (all p 's < 0.001) and substantial (all eta-squared values approximately in the range 0.01-0.03) factor (tables 3_1 and 3_2). The effect sizes of the taste group variable must be qualified as small (eta-squared < 0.06) for all problem behaviors (Cohen, 1988). Other known

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predictors of problem, included in the model as confounds, nearly all revealed effect sizes in the small (0.01-0.06) range as well. This shows that, when is controlled for a set of relevant confounders music taste membership remains a relevant factor for the explanation of variance in problem behavior.

Table 3_1

Effect sizes of factors associated with the measures of problem behaviors

	Withdrawn behavior	Somatic complaints	Anxious-depressed	Aggressive behavior
Music group	.01	.01	.01	.02
Gender	.02	.06	.04	-
Age	.01	-	-	.01
FAS	.01	-	-	-
School-level	.01	.01	-	-
School achievement	.01	.01	.01	.04
Social support				
Mother	.03	.01	.05	.02
Father	.02	.01	.02	.02
Friends	.02	-	.01	-

Table 3_2

Effect sizes of factors associated with the measures of problem behaviors

	Delinquent behavior	Social problems	Thought problems	Attention problems
Music group	.03	.01	.02	.01
Gender	.01	-	.01	.01
Age	.02	-	-	-
FAS	-	.01	-	-
School-level	.01	.02	.01	-
School achievement	.04	.01	.02	.09
Social support				
Mother	.03	-	.02	.02
Father	.01	.01	.01	.02
Friends	-	-	.02	.02

Note: Effect sizes reported concern the partial eta-squared values within the multivariate GLM analysis. The overall multivariate effect was significant at the $p < .001$ level. The effects sizes associated with the specific behavioral scales are reported here. A partial eta-squared between .01 and .06 reflects a small effect size, and partial eta-squared within the .06-.13 range concerns a medium effect size, a value of .14 or higher represents a large effect (Cohen, 1988).

Internalizing problem behavior

Tables 4_1 and 4_2 summarize the between group differences on the range of problem behaviors. Tests revealed that groups differ in withdrawn behavior ($F(6, 4131) = 6.00, p <$

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0.001). Post hoc comparisons with Bonferroni corrections for multiple comparisons showed that both the *Omnivores* and the *Elitists* report relatively high levels of withdrawing tendencies. The *Exclusive Rock* group also reported relatively high levels of withdrawn behavior but their scores did not differ from other groups significantly, due to small group size, and therefore lack of statistical power to discern differences. The *MOR* and *Rock-Pop* groups report relatively little withdrawn behavior.

Omnivores report most somatic complaints, and their average differs significantly from nearly all other groups ($F(6, 4131) = 6.31, p < 0.001$). The *Rock-Pop* group scored higher than the *MOR* group that, again, had the lowest prevalence of somatic complaints.

Table 4_1
Taste groups and average scores on the Youth Self-Report

	Withdrawn behavior	Somatic complaints	Anxious-depressed	Aggressive behavior
MOR	1.65 ^a	1.58 ^a	1.40 ^a	1.77 ^a
Urban	1.82 ^{a,b}	1.83 ^{a,b}	1.52 ^a	2.04 ^b
Exclusive Rock	2.19 ^{a,b,c}	1.69 ^{a,b,c}	1.70 ^{a,b}	2.17 ^{a,b}
Rock-Pop	1.68 ^a	1.87 ^b	1.48 ^a	2.02 ^b
Elite	2.01 ^{b,c}	1.70 ^{a,b}	1.65 ^{a,b}	1.65 ^a
Omnivore	2.07 ^c	2.03 ^c	1.82 ^b	2.18 ^b
Low-involved	1.91 ^{a,b,c}	1.72 ^{a,b}	1.59 ^{a,b}	1.59 ^a
Overall	1.80	1.76	1.55	1.95

Table 4_2
Taste groups and average scores on the Youth Self-Report

	Delinquent behavior	Social problems	Thought problems	Attention problems
MOR	1.62 ^a	1.42 ^a	1.19 ^a	2.53 ^a
Urban	2.00 ^b	1.47 ^{a,b}	1.36 ^{a,b}	2.67 ^a
Exclusive Rock	2.51 ^b	1.76 ^{a,b,c}	2.31 ^c	2.94 ^{a,b,c}
Rock-Pop	1.99 ^b	1.45 ^a	1.39 ^b	2.75 ^{b,c}
Elite	1.30 ^a	1.72 ^c	1.22 ^{a,b}	2.50 ^{a,b}
Omnivore	1.98 ^b	1.69 ^c	1.79 ^c	2.91 ^c
Low-involved	1.44 ^a	1.91 ^{b,c}	1.27 ^{a,b}	2.27 ^a
Overall	1.85	1.53	1.40	2.67

Note. Scales range from 0 to 10, with 0 indicating total absence of problems, and 10 indicating maximum scores on problem measures. None of the group averages were in the clinical range of problematic functioning. Significance of differences between groups was tested in the multivariate GLM Pairwise Posthoc Comparisons, using the *Bonferroni* correction method ($p < .05$). Due to the small group size of the Exclusive Rock fans their higher group averages do not always differ significantly from other groups.

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Omnivores also tend to be more anxious and depressed; they have higher scores than most other groups ($F(6, 4131) = 6.29, p < 0.001$). The *Exclusive Rock* and *Elite* clusters also had relatively high prevalence rates, but results with other groups were not significant. The *MOR*, *Rock-Pop* and *Urban* groups revealed low levels of anxiety/depression. A separate MANOVA testing two items of the anxious-depressed subscale and included the influence of confounders, revealed that *Exclusive Rock* fans and the *Omnivores* report engaging in deliberate self-harm more often than other groups. The taste groups did not differ significantly from each other on the item on suicidal thoughts.

Externalizing problem behavior

The *Omnivores*, *Rock-Pop* and *Urban* fans report engaging in aggressive behavior more often than the *MOR*, *Elitist*, and *Low-Involved* groups ($F(6, 4131) = 18.39, p < 0.001$). *Exclusive Rock* fans tend to aggressive behavior as well, but differences with other groups were not significant.

The same pattern emerges in the reports on delinquent behaviors ($F(6, 4131) = 10.93, p < 0.001$), with *Omnivores*, *Rock-Pop* and *Urban* fans engaging in more delinquent behavior. Here the differences between the high scoring *Exclusive Rock* fans and the less delinquent *MOR*, *Elitist*, and *Low-Involved* groups were significant.

Social, Thought and Attention Problems

Both the *Omnivores*, the *Elitists* and the *Low-Involved* groups report relatively high prevalences of social problems ($F(6, 4131) = 6.44, p < 0.001$). The *MOR* and *Rock-Pop* groups encounter relatively few problems in this domain.

Omnivores and *Exclusive Rock* fans indicate having more thought problems than the other groups ($F(6, 4131) = 615.83, p < 0.001$). The *MOR* group, again, shows relatively few problems.

Omnivores and the *Rock-Pop* group report relatively high prevalences of attention problem ($F(6, 4131) = 8.71, p < 0.001$). The *Exclusive Rock* fans again even exceed these groups in their attention problem ratings but differences with other groups are not significant. The *MOR* and *Low-involved* groups reveal little problems.

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Several authors have observed that a preference for deviant music, more specifically heavy metal, may be associated with more internalizing distress for girls. In a separate analysis interactions between gender and taste group membership with regards to all types of problem behavior were tested. No significant interactions were found, indicating that on the whole, male and female members of taste groups show the same levels of problem behavior.

Discussion

The aim of this study was to create a typology of the adolescent pop music audience, and to assess differences in problem behavior associated with taste group membership. In order to create a useful typology of adolescent pop music audiences, first the underlying structure of music preferences was explored, resulting in the identification of four major styles: Rock (e.g. heavy metal and punk), Urban (hip-hop, and soul/ R&B), Pop-Dance (e.g. chart-based music and different types of Dance music), and Elite (jazz and classical music). From the late eighties onward, research on the underlying structure of music preferences has reported similar findings, indicating large cross-cultural and diachronic stability in the way audiences categorize genres of pop music. (Christenson & Peterson, 1988; Tillekens; 1993; Stevens; 2001; Ter Bogt et al., 2003). While the popularity of individual artists may rise and fall in relatively short periods, popular musical styles seem to have a prolonged existence. Rock, Pop, Urban, and Elite styles have been described with similar labels during the last two decades.

Approaches to music taste using either multi-dimensional scaling, factor-analysis or simple genre preference all fall short of identifying taste groups within the audience, i.e. a factor (style) is not identical to a group (cluster). Assuming that different taste groups hold different composites of likes, dislikes, and neutrality towards different types of music, we have tried to identify groups of fans with similar taste patterns by applying cluster analysis to music style scores. As our structuring of genres in styles corroborated earlier efforts to do the same, we assumed that the style scores formed a robust input for the cluster analysis, performed to reveal a more detailed segmentation of the music audience than in prior studies. Six different taste groups were exposed through using this clustering procedure – *Middle-of-the-Road (MOR)* fans; *Urban* fans; *Exclusive Rock* fans; *Rock-Pop* fans; *Elitists*; and *Omnivores*. Our findings compare well to the clustering of respondents in the study by Ter Bogt et al. (2003),

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that was based on music preferences of an older sample of Dutch adolescents and young adults in 1999, and revealed a similar six cluster structure.

Among our sample of 12 to 16 years old adolescents, the *MOR* and *Urban* taste groups are oriented positively only towards the popular styles Pop-Dance and Urban respectively, and comprise approximately two-fifths of the sample. Females are over-represented in these two groups, as well as in the *Elitist* group. The *Exclusive Rock* and *Rock-Pop* groups constitute roughly a third of the sample, males are overrepresented in these groups. Both groups have a strong liking for rock music, however, for the *Exclusive Rock* group this preference is rather narrow. They avidly dislike all other types of music while the *Rock-pop* group shows a far broader approval of other music types than Rock alone. The gender differences in group composites seem to reflect broader social and cultural patterns (Christenson & Peterson, 1988). In his seminal work on the sociology of popular music, Simon Frith (1978) already discerned melodic, catchy love songs that populate the charts as music to be predominantly liked by females, as opposed to noisy, ‘cocky’ rock music favored more often by males. Thereby, not only the structuring of styles, but also the gendered differences in taste group composition and their adherence to softer and harder forms of music, indicate the existence of rather persistent cultural patterns in the appreciation of music.

Omnivores, as the term implies, indicated liking all kinds of music. Respondents with an omnivorous music taste have been described before (e.g. Bryson, 1996; Peterson & Kern, 1996; Van Eijck, 1999), however, these studies focused on a much older population. These studies showed that musical exclusiveness, i.e., disliking of genres, decreases with age and education. It is therefore remarkable to find among young music consumers, a group so open towards such divergent music styles. The identification of groups such as the *Omnivores* evidences the use of clustering methods to sketch the composition of the music audience. Simply equalizing respondents’ music preferences with taste group membership cannot reveal the existence of groups with a complex taste, in other words, the multi-style preference input probably results in a more realistic picture of the adolescent music audience.

Adolescent problem behavior

In this research project, for the first time, a large representative sample of adolescents was assessed on the link between music preference and problem behavior. Using the results of

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cluster analysis as input for discerning differences in problem behavior between groups within the music audience this research constitutes a shift from studying risk *factors* to uncovering the effects of membership of risk *groups*. Multivariate analyses showed that taste group membership is a relevant factor in explaining variance in psychosocial functioning, even when controlling for known predictors, such as gender, age, family affluence, school-level, school achievement, and social support from parents and friends. Moreover, we found effect sizes, be it small, for music taste group membership, but as other predictors of problems, included in the model as confounds, revealed effect sizes of similar magnitude, it is important to notice that music preference as a factor in the etiology of problem behavior can compete with well-known predictors of adolescent distress.

While on average none of the musical taste groups were within the clinical range of scores of psychosocial functioning, clear differences between taste groups emerged in the level of psychosocial problems they reported experiencing. The group that prefers mainstream, happy-go-lucky chart music, the *MOR*-group shows relatively few internalizing problems. Contrary, *Exclusive Rock* fans and *Omnivores* report experiencing internalizing problems and deliberate self-harm more often than others. However, *Exclusive Rock* fans, no more 2% of the sample, did not always significantly differed from other groups, due to small group size, and therefore lack of statistical power to discern differences. *Elitists* scored relatively high as well on withdrawing tendencies.

Our results corroborate results from previous studies reporting higher levels of internalizing problems among fans with a strong preference for loud Rock music (Arnett, 1991, 1996; Lacourse et al, 2001; Martin et al, 1993; Scheel & Westeveld, 1999), however, we must add that this seems to only typify the *Rock* fans with an exclusive taste for this type of music. It is not a preference for loud, brash Rock music per se that predicts elevated problem scores: Rock fans from the *Rock-Pop* group even show relatively low scores on two of the three internalizing distress measures. Furthermore, analyses examining the gender and taste group membership interaction did not bring up any significant results. This seems to imply that while female Rock fans in the US, Canada and Australia may experience more internalizing problems, Dutch female liking the same type of music, even within the group that prefers exclusively Rock music, do show elevated problem levels, compared to males. This may hint at cross-cultural differences, with loud music being a less unconventional choice for girls in the

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Netherlands, as signified by the great popularity of one specific Rock subgenre -Gothic- in the Netherlands (and across Western and Southern Europe). Even though the majority of fans for Rock music in the Netherlands is still male, females do not form a tiny minority next to them, and they may specifically be attracted to Rock genres that combine sheer volume with delicate melodies, casting a symbolic universe that recreates and enhances the thrills and delights of gothic novels and fairy tales.

Somewhat surprising are the relative high internalizing problem scores for *Elitists* and *Omnivores*. *Elitists* seems to adhere to music choices that reflect those of their parents and, more in general, this group is not characterized by a rebellion against parental authority (Ter Bogt et al., 2003). However, it may just be that their choice of music alienates them from their peers who massively prefer other types of music (North et al., 2000). Elitism in music taste may reflect an outsider position in the adolescent peer culture, and this social position may cause more internalizing distress. On the other hand emotionally unstable adolescents may be drawn to music that is at the same time complex, reflexive, moody and full of comfort (Ter Bogt, 2004b; Rentfrow & Gosling, 2004). In our research *Omnivores* do not come from families with a higher social economic status, as indicated by their scores on the Family Affluence Scale, but other research has qualified *Omnivores* as a cultural elite (Bryson, 1996; Peterson & Kern, 1996). The socio-cultural position of adolescents with a broad taste does not seem to protect them from internalizing distress. Music is obviously a source of mood enhancement (Christenson & Roberts, 1998) and it seems that the group with the broadest taste needs this effect of music most.

Regarding externalizing problems, the *MOR*, *Elitist* and *Low-Involved* groups on the whole showed less transgressive behavior and aggression than the *Urban*, *Rock-Pop*, *Exclusive Rock* and *Omnivore* groups. Thus, it may be concluded that groups with tastes that are more adult-oriented (*Elitist*) or mainstream-oriented (*MOR*), and groups that are not particularly tied in to pop culture (*Low-involved*) show relatively little externalizing problem behavior. The higher scores among the *Urban*, *Exclusive Rock* and *Rock-Pop* groups on externalizing problem behaviors may be partially explained by the fact that hip hop and the harder rock forms project images of resistance to adult authority combined with increased peer orientation. Previous studies focusing exclusively on adolescents liking either hip hop (Miranda & Claes, 2004) or heavy metal music (e.g. Martin et al., 1993; Arnett, 1991, 1996) have also reported

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these preferences as risk factors for risk-taking, transgressive behavior and substance misuse. A certain degree of rebelling against adult institutions and transgression of their rules is normative in adolescent development (Arnett, 1996; Steinberg, 2002) and this seems to be particularly apparent among the *Urban* and *Rock*-liking groups of young people, who appear to synchronize their music preferences with their own behavior. In addition to the *Urban*, and the *Exclusive Rock* and *Rock-Pop* fans, all likely candidates for the prevalence of more externalizing distress, we have uncovered one other risk group: the *Omnivores*. Again, their potential position among the cultural elite does not prevent them from showing more aggressive and delinquent behavior.

Regarding social, thought and attention problems the *Omnivores* stand out with more problems than most other groups, and the *Exclusive Rock* group shows elevated problems as well. Youth belonging to groups liking the most popular, mainstream types of music, i.e., those in the *Middle-of-the-Road (MOR)* group seem to experience fewer social, thought and attention problems.

Previous findings on the relationship between a preference for rock and/or heavy metal and externalizing problems (e.g. Martin et al., 1993; Arnett, 1996; Scheel & Westefeld; 1999) have been partially explained by adverse family circumstances (Lacourse et al., 2001), or a problematic relation to the school system and social institutions in general (Roe, 1995; Arnett, 1991; 1996). We have controlled for these factors and still found music taste group membership predictive of psychosocial functioning among adolescents. In contrast with earlier research we also found that music taste membership is indicative of internalizing distress. It may be that our research entailed a large sample of respondents and therefore it disposed over far more power to statistically discern differences. Another possibility is that we differentiated more into detail among the pop audience and more clearly identified taste groups - *Exclusive Rock* fans, *Elitists* and *Omnivores*- that have not been described in relation to internalizing distress before.

Claes and Miranda (2004) found that music taste plays a unique role in explaining adolescent transgressive behaviors. They compared different types of hip hop fans, i.e., ranging from preference of less to more deviant types of hip hop, on reported behavioral deviancy, while controlling for amount of peer's deviancy (the most relevant factor in this type of behavior), amount of violent media consumption, and importance given to lyrics. They suggest

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that the unique explanatory value of music taste lies in the strength of the cultural identity some types of music can offer. This is especially obvious in the case of gangstarap, which has a strong (antisocial) identity to offer. We found the two types *Rock* fans, the *Urban* fans and the *Omnivores* to be more prone to externalizing distress, thus finding more evidence for the intricate link between membership of taste groups liking rebellious, high energy types of music and transgressive behavior.

Furthermore, it is interesting to notice that the *Omnivores* and *Exclusive Rock* fans overall show higher levels of problem behavior while the *MOR* group consistently reports relatively few problems. In the fifties the development of new forms of popular music, i.e. Rock ‘n Roll, led to grave concerns over its impact on the mental health and moral behavior of youth. About five decades after Rock’Roll surfaced it can be concluded that, indeed, a link exists between a fondness for certain types of music or a general enthusiasm for all kinds of music, and problem behavior, but results also show that at least a preference for mainstream pop music may buffer problems. And though we found that membership of groups that are routinely labeled as ‘deviant’ indeed is a risk factor for internalizing and externalizing problem behavior, it is important to stress that listening to music, even ‘deviant’ music may play an important role in coping with stress. For example, Lacourse et al. (2001) found that for girls vicarious listening to heavy metal decreases suicide risk and therefore, this type of music use may constitute an effective coping mechanism. This was also put forth by Weinstein (1991) and Arnett (1996) who conducted extensive ethnographic studies on the heavy metal subculture and its fans. They consistently found that the music’s main appeal lies in the expression of social defiance, and this expression of resistance to the ‘respectable’ adult society lends the music its function as a tool for coping. Recognition of experiences shared throughout a subculture, whether heavy metal or the socially less accepted forms of rap, can be sufficient in itself, if not a means to cathartic release of negative emotions.

In the present study only patterns of taste and associations between taste group membership and problem behavior were examined. As for all the associations reported upon in this project we can only speculate on the causal mechanisms that may play a role. Three possible developmental models seem plausible: adolescents with specific emotional or behavioral characteristics may tune in to certain types of music (selection), the music itself or the symbolic universe of which music is an integral part may trigger people to certain emotions

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and behaviors (direct influence of music), or music may be a cultural marker for the formation of groups and those groups may in turn influence their members' behavior (indirect influence or music) (Brown, Morry & Kinney, 1994; Miranda & Claes, 2004; Ter Bogt, 2004b). In order to further understand the possible role that music can play in adolescence, and more specifically the development of psychosocial distress, it is necessary to follow individuals over time. What is needed next, is research assessing just how these groups develop and differ in the way they use music, and how this relates to their social position and to their well-being and behavior. Moreover, prospective studies may in turn uncover the mechanisms through which development of musical taste and development of problem behavior are linked within the course of growing up, and may enable distinguishing between reflective and causative aspects of the association of music taste with psychosocial functioning of adolescents.

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STUDY 5

Thank you for the music! A typology of music users and their characteristics in terms of music taste, emotions during listening and level of internalising problems

Based on: Mulder, J., Ter Bogt, T.F.M., Raaijmakers, Q.A.W. & Nic Gabhainn, S. (submitted). Thank you for the music! A typology of music users and their characteristics in terms of music taste, emotions during listening and level of internalising problems.

Abstract

This study extends the literature on music use by constructing a typology of music listeners based on both levels of involvement with music and patterns of music use. The music listener groups were compared in terms of time spent listening, music taste, reported emotions during listening and internalising problems. Dutch respondents aged 12 to 29 years filled in internet questionnaires ($N=997$). The music listener typology was constructed following a latent class analysis of five scales; one of music involvement and four of music use; labelled good vibes, coping, identification, and friendship criterion. The developed typology comprises three groups of listeners. First, a highly involved group ($n=196$) was most positive on all 5 measures. Second, a large group scored moderately positively on all measures and was labelled medium-involved ($n=740$), and third a group of low-involved listeners ($n=61$) was only somewhat positive on the scale good vibes, while negative on the other measures. The high-involved listeners spent most time per day listening and were most positive towards various music styles, specifically towards Dance and Urban styles. Though not particularly characterised by higher levels of internalising distress, this group embraced using music for coping with distress most clearly. High-involved listeners reported high levels of positive affect and low levels of negative affect during listening. This indicates, contrary to previous suggestions in the literature, that high levels of music involvement are not necessarily associated with emotional difficulties. Rather, those highly involved with music can be considered life artists who know how to use music to enrich life.

Introduction

Although people differ in their involvement with music, most appreciate music as enriching and invigorating life (e.g., Christenson & Roberts, 1998a; Hargreaves & North, 1997; Ter Bogt, 2008). The purposes that music listening can serve are varied (Merriam, 1964; Saarikallio & Erkkilä, 2007). Foremost, music offers diversion and entertainment. Music listening is also used as a technique for mood management, as well as identity construction, in terms of both a personal and a social sense of self (Christenson & Roberts, 1998a; Gantz, Gartenberg, Pearson & Schiller, 1978; Larson & Kubey, 1983; Lull, 1985; Te'Neil Lloyd, 2002; Tekman & Hortacsu, 2002). In addition, studies have suggested that music is used to help deal and cope with levels of internalising problems, such as depression and anxiety symptoms (Arnett, 1996; Lacourse, Claes & Villeneuve, 2000; Larson, 1995; Sloboda & O'Neill, 2001b). However, a systematic overview of music preferences and emotional correlates of groups with different music use profiles has been missing to date. This study sought to complement the extant literature on the use of music by constructing a typology of music listener groups in terms of levels of music involvement and music use. Subsequently, these music listener groups were compared on time spent listening to music and music preferences, and furthermore characterised in terms of valence of emotions during listening (positive and negative) and level of internalising distress.

Involvement with and uses of music

Music listening has never been so easy, widespread, and under individual control, following recent technological developments such as portable audio, digitalised music formats, and the use of the internet for exchanging audio files (Hargreaves & North, 1999). Consequently, music pervades our lives. However, individuals differ in their degree of involvement with music. As a consequence, for example, large variations are found among listeners in terms of their knowledge of music (Brown & O'Leary, 1971; Christenson & Roberts, 1998a; Mulder et al., 2007).

Regardless of degree of involvement, the most ubiquitous type of music use concerns listening to music as a means to distract from, or enhance, current affective states during mundane activities such as personal maintenance, travel, and active leisure (Sloboda & O'Neill,

2001b). Music has also been reported to comprise a background form of entertainment that facilitates social relationships by helping to avoid uncomfortable silences and providing an upbeat atmosphere (e.g., Roe, K., 1985).

Music can be a powerful tool in mood management (Christenson & Roberts, 1998a; Juslin & Laukka, 2004; Larson, 1995; North et al., 2000; Sloboda & O'Neill, 2001b; Wells & Hakanen, 1991). For instance, a study among seventh and ninth graders into self-reported psychological symptoms and coping strategies, found that music listening was the most frequently used coping strategy “when facing difficulties or when feeling tense” (Kurdek, 1987). Fans of loud music such as heavy metal, have indicated that they listened to their preferred music when angry and when needing to vent anger (Arnett, 1991a). In addition, feelings of sadness and loneliness can be alleviated by choice of music (Avery, 1979; DeNora, 1999; Kurdek, 1987; Larson, 1995). Thus, music listening has been found to be a useful and versatile tool for coping with emotional distress.

A different type of music use serves to facilitate identity construction. Music offers several elements that are useful as tools in processes of identity formation, whether that of self or others, that is, lyrics and ideas expressed by artists, and more diffusely, sound and image of an artist or band. Identification can take the form of recognising oneself in lyrics and the artists (Giles & Maltby, 2004) and thus relates to personal identity (DeNora, 2000). Choices in music listening also enable situating oneself in the social world (DeNora, 2000; Frith, 1981; Hargreaves et al., 2002; Sloboda & O'Neill, 2001b; Tarrant et al., 2002). That is, music preferences aid in social perceptions (Knobloch et al., 2000) and influence friendship formation (Selfhout, M. H. W. et al., 2007).

These uses of music have been quite extensively documented. Nevertheless, some important questions remain unanswered. People differ in terms of how involved they are with music, and differential patterns of music use should be expected based on these levels of involvement. Therefore, constructing a typology in terms of both degree of involvement with music as well as patterns of music use would provide a more coherent picture of music listeners than an overview of the prevalence of different music uses would provide. Such a typological approach has the additional advantage of taking interrelatedness of different music uses into account.

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In addition, constructing such a typology would enable the investigation of the distribution of different music preferences by music listener groups. So far, only studies on fans of heavy metal music indicated that they use their preferred music for coping with distress and as a positive source of identification to help deal with internalising problems, such as depression (Arnett, 1996; Lacourse et al., 2000; Roe, K., 1992; Roe, 1995; Scheel & Westefeld, 1999). Although Tia DeNora (2000) studied music uses in the everyday lives of ‘normal’ music listeners of different age profiles, music listeners grouped by characteristic profiles of music uses have not been compared in terms of music preferences and emotional correlates such as affect during listening and internalising symptoms.

In sum, this study was conducted to extend the literature on music use by constructing a typology of music listeners based on both levels of involvement with music and patterns of music use. The music listener groups were subsequently compared in terms of time spent listening, music taste, reported emotions during listening and internalising problems.

Method

Sample

The sample was obtained by approaching members of an internet-panel part of the Qrius Switch-On project (see www.qrius.nl). Data collection took place around April 2004. The panel consisted of 2,227 participants aged 12 to 29. As males were underrepresented (32.3%), males and females were matched in number, as well as in age and educational level. This resulted in a sample consisting of 997 respondents, with 501 females aged 12-29 (mean age 20.35, SD 3.91), and 496 males (mean age 20.59, SD 3.96).

Measures

Level of education was represented by asking respondents which level of education they were currently receiving (for school-attendees), or had attended (for those who had left school). They were divided into low (low and middle vocational track; n=508) and high (high vocational and academic track; n=489) level groups.

Music use was assessed by inviting panellists to rate attitudinal statements in terms of “the degree to which this applies to you” (see table 1). Ratings were obtained using 5 point

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Likert type scales ranging from 1 “not at all” to 5 “applies completely”. Exploratory factor analysis (estimator; Maximum Likelihood, Quartimin [oblique] Rotation) was used to analyze the underlying structure of the music functions items (Muthén & Muthén, 1998-2006).

Quartimin Rotation was preferred over Varimax Rotation, as the latter seeks to create a first component with maximum amount of variance ascribed to it, assuming the factors are uncorrelated. Quartimin Rotation is an oblique rotation that allows for components to be correlated.

The five factor solution (see table 1) was most adequate ($\chi^2= 271.58$, df 100, $p<.001$; $RMSEA = 0.041$ (confidence interval 0.036-0.047), $CFI=0.964$ (MPlus Version 5.0). The first scale measured involvement with music. ‘Music involvement’ was represented by statements such as “I talk a lot about music with friends” (Brown & O’Leary, 1971), and “I can’t live without music”. The second scale labelled ‘good vibes’ was measured by such items as “Music makes other things less boring”, and “Music creates a good atmosphere when with others” (Gantz et al., 1978; Roe, K., 1985). The use of music for ‘coping’ consisted of statements such as “I always play music when I feel sad”, “With music I can vent aggression” (Lacourse et al., 2000). ‘Identification’ was assessed by ratings of “Lyrics of my music express how I feel”, “I recognize myself in the lyrics of my favourite artists”. The fifth scale assessed the use of music as a ‘friendship criterion’. It consisted of statements such as “I find it important that my friends listen to the same music”.

Time spent listening was assessed by asking respondents to indicate time spent listening to music daily. Response categories were 1 (<30 minutes); 2 (30-60 minutes); 3 (1-1.5hrs.); 4 (1.5-2hrs.); 5 (2-4hrs.); 6 (4-6hrs.); 7 (6-8hrs.); and 8 (> 8 hrs).

Music preferences were measured by asking participants to rate twenty-five musical genres on a 5-point scale ranging from ‘dislike strongly’ to ‘like very much’ (Ter Bogt, Raaijmakers et al., 2003). Exploratory factor analysis (estimator; Maximum Likelihood, Quartimin Rotation (Muthén & Muthén, 1998-2006)) was used to analyze the underlying structure of the genre preferences. A five factor solution proved adequate, explaining an estimated 57.91% of the variance in music preference scores. Loadings on the supposed factors varied between 0.47 and 0.89. Each factor comprising related genres was considered to represent a style. The preference ratings of the genres *Top 40* (chart-based

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Table 1

Exploratory factor analysis of items measuring uses of music

	Factor				
	1	2	3	4	5
Music involvement ¹					
I am always looking for new music	-.698	.028	-.034	.062	-.043
I know more than peers about music	-.682	-.030	.053	-.041	-.020
I influence my friends with my music taste	-.514	.056	-.077	.114	.167
Can't live without music	-.446	.051	.319	-.079	-.078
Good vibes ²					
Music makes other things less boring	.014	.587	.004	-.044	-.061
Music helps against boredom	-.075	.505	.127	-.033	-.035
Music creates a good atmosphere when with others	-.117	.483	-.082	.018	.104
Music helps me to relax and stop thinking about things	-.034	.270	.244	.048	.004
Coping ³					
Music helps me get through my life	-.182	-.029	.628	.080	.069
With music I feel less lonely when alone	.119	.268	.476	.125	.076
I always play music when I feel sad	.103	.133	.455	.274	-.067
With music I can vent aggression	-.078	.071	.255	.173	.035
Identification ⁴					
I recognize myself in the lyrics of my favourite artists	.020	-.040	-.006	.837	-.012
Lyrics of my music often express how I feel	-.005	.012	.044	.761	-.051
My favourite artists have ideas that appeal to me	.132	.027	.000	.551	.088
Artists are an example to me	-.136	.034	.092	.334	.188
Friendship criterion ⁵					
I find it important that my friends listen to the same music	.022	.010	.023	-.040	.723
I can't be friends with someone who dislikes my music	.002	-.175	.101	-.018	.512
My friends have the same music taste as I do	-.046	.145	-.134	.062	.443

Note: Extraction using Maximum Likelihood, and Quartimin Oblique Rotation. $\chi^2=271.58$, $df=100$, $p<0.001$; CFI=0.964, TLI=0.931, RMSEA = 0.042 (confidence interval 0.036-0.047). Quartimin factor correlations ^{1,2}= -0.28; ^{1,3}= -0.30; ^{1,4}= -0.27; ^{1,5}= -0.27; ^{2,3}=0.41; ^{2,4}=0.27; ^{2,5}=0.10; ^{3,4}=0.54; ^{3,5}=0.10; ^{4,5}=0.11 .

music), *ballads*, *boy bands*, *Latin pop*, and *Dutch pop* were related and labelled Pop style. A second style was labelled Urban, and comprised the genres *R&B*, *dancehall*, *rap/hip hop*, and *reggae*. A third style was constructed based on relatedness in preference ratings of the genres *classical music*, *singer/songwriter*, *jazz*, *soul/R&B*, and *lounge music*, and was labelled Elite. A Rock style was constructed of the genres *hardrock*, *heavy metal*, *rock*, *punk*, *alternative*, and *gothic*. Finally, ratings of the genres *dance*, *trance*, *electro*, *techno*, and *hardhouse* were labelled as Dance. This structuring of the genre ratings proved similar to previous Dutch, Flemish and American research on the structure of music preferences using factor analysis or

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multi-dimensional scaling techniques (Christenson & Peterson, 1988; Stevens, 2001; Ter Bogt et al. 2003; Tillekens, 1993). The mean of summed preference ratings of genres within the styles Pop, Urban, Elite, Rock and Dance were constructed as style-scores.

Emotions during listening were assessed by asking respondents to rate the degree to which they experienced the following emotions during listening to their favourite music. Emotional descriptors were taken and adapted from the Positive Affect Negative Affect Scale (PANAS) (Watson, Clark & Tellegen, 1988). The following affect scales were used: positive affect (active, strong, happy, connected, inspired, enthusiastic, energetic, proud; Cronbach's alpha = .81), and negative affect was divided into sad affect (afraid, sad, lonely; Cronbach's alpha = .78) and angry affect (aggression, anger, hate; Cronbach's alpha .84). Respondents were asked to indicate the degree to which these emotions were experienced on five point Likert-type scales, ranging from 1 (applies not at all) to 5 (applies completely).

Internalising problem behaviour was assessed using the Nijmegen Problem Behaviour List (NPBL). Items are formulated to represent problem behaviour (withdrawn and anxious/depressed behaviour) in a non-clinical setting. The NPBL contains 9 items on a 5-point scale and is validated as a self-report measure (Branje, van Lieshout, van Aken & Haselager, 2004; De Bruyn, Vermulst, Houtmans & De Meyer, 1997; Delsing, van Aken, Oud, De Bruyn & Scholte, 2005). The items represent some common problems that cause concern, but are not serious enough for referral (Delsing et al., 2005). Examples of items are "I would rather be alone than with other people" (Withdrawn), and "I feel sad and unhappy" (Anxious/Depressed Behaviour). Respondents were asked to indicate on 5-point Likert scales ranging from 1 (*not at all true*) to 5 (*completely true*) the extent to which each item applies to them.

Preliminary Analysis

The mean of the item scores of the five music listening scales (both music involvement and music use) were used as input for the Latent Class Analysis (LCA) in Mplus 5.0 (Muthén & Muthén, 1998-2006). Two types of LCA were run; that is, one in which the scales were assumed to be independent, and one in which the scales were allowed to co-vary (see table 2). The latter procedure resulted in the best class solution, with three classes distinguished as the best fitting model, based on the fit measures reported in table 2.

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The importance of allowing for co-varying music use scales corroborated the factor analysis reported in table 1. According to that analysis, using music for coping was positively related to using music for good vibes ($r=0.41$) and identification ($r=0.54$). The latter two were less strongly related ($r=0.27$). Using music as a friendship criterion correlated weakly with the other scales (around 0.10). Music involvement correlated negatively with the four music uses (between -0.23 and -0.10), and therefore can be considered a concept different from that measured by the other four music listening scales.

Table 2

Model fit results for the latent class analysis solutions

<i>Model: default</i>					
	LogL	# par's	BIC	LRT <i>p</i> -value	Entropy
2	-5512.96	16	11085.57	0.000	0.623
3	-5439.35	22	10960.73	0.020	0.688
4*	-4619.40	28	9343.20	0.247	1.000
5*	-4603.23	34	9333.24	0.009	0.935
<i>Model: Covariances allowed</i>					
2	-5364.17	26	10825.29	0.959	0.959
3	-5346.07	32	10811.46	0.001	0.873
4*	-5330.55	38	10802.79	0.107	0.918
5*	-5330.41	44	10824.89	0.918	0.799

* These models suffered from a non-positive definite first-order derivative product matrix, and thus unreliable estimates.

Analysis

First, a MANOVA was employed to investigate group-based differences in involvement with music in terms of time spent listening, and their type of music preference. A second MANOVA assessed group-based differences in terms of emotions during listening, and levels of internalising distress. In both MANOVAs gender, age and educational level were controlled.

Results

Descriptives

The profiles of all respondents together as well as of the three latent classes, or music listener groups, are presented in Table 3. The three listener groups differed in terms of gender ($\chi^2(2,994) = 11.82, p < 0.01$), with most notably more females than males in the high involved

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group. The music listener groups did not differ significantly in terms of age ($F(2,994) = 1.66$, $p = 0.19$) nor educational level ($\chi^2(2,994) = 0.67$, $p = 0.72$). For all respondents together, music involvement was rated highly. Using music for good vibes was the most highly rated scale of music use. Next came using music for coping, while identification was only mildly positively rated, and most respondents did not identify with music as a friendship criterion.

Table 3

Profiles of the groups of music listeners: Means (SD) of age, percentages of females and low-educational level, and estimated means (SE) on the music use scales

	Class # 1 High- involved	Class # 2 Medium- involved	Class # 3 Low- involved	All
Age	20.02 (3.80)	20.59 (3.93)	20.44 (4.27)	20.47 (3.93)
% female	61.22	47.43	49.18	50.25
% low educational level	51.02	51.35	45.90	51.00
<i>Music uses scales</i>	<i>M (SE)</i>	<i>M (SE)</i>	<i>M (SE)</i>	<i>M (SD)</i>
Music involvement	3.95 ^a (.05)	3.46 ^b (.03)	3.02 ^c (.18)	3.53 (0.74)
Good vibes	4.99 ^a (.01)	3.84 ^b (.01)	3.90 ^c (.08)	4.06 (0.50)
Coping	4.11 ^a (.06)	3.63 ^b (.04)	2.06 ^c (.16)	3.49 (0.83)
Identification	3.66 ^a (.07)	3.27 ^b (.04)	2.30 ^c (.17)	3.16 (0.82)
Friendship criterion	2.45 ^a (.06)	2.32 ^a (.03)	1.93 ^b (.11)	2.32 (0.70)
<i>N</i>	196	740	61	997

Note: Scores on scales represent means (and standard deviations) on Likert-type scales ranging from 1 (does not apply) to 5 (applies completely). See text for tests of group-based differences in terms of age, gender, and educational level. Where superscripts differ, group differences are significant at $p < .01$. Group-based differences were tested for in pair-wise comparisons in a MANOVA, using the Bonferroni correction for multiple comparisons.

The first group identified by the LCA consisted of approximately one fifth of the sample (19.7%), and was characterized by the most enthusiastic music use. In terms of music involvement, good vibes, coping, and identification they were most positive, and least negative regarding importance of friendship criterion. They were labelled high-involved. The second group comprised nearly three quarters of the sample (74.2% of the sample). They were positive towards music use in terms of good vibes, and somewhat positive towards coping, identification and music involvement. Using music as a friendship criterion was rated negatively. Following their lower enthusiasm compared to the first group, they were labelled medium-involved. The third group was labelled low-involved (6.1% of the sample), because

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they were neutral on music involvement, and most negative towards the four music use scales compared to the other two groups. The low-involved were only somewhat positive on using music for good vibes.

Table 4

MANOVA's of music listener group, gender, educational level, and age on daily listening time, music style preferences, internalising problems and emotions during listening

	<i>df1</i>	<i>df2</i>	<i>F^a</i>	partial <i>η²</i>	<i>p</i>
<i>Daily listening time and music style preferences</i>					
<i>Multivariate tests</i>					
Music listener groups	12	1966	8.00	0.05	<.001
Gender	6	982	33.86	0.17	<.001
Educational level	6	982	14.73	0.08	<.001
Age	6	982	8.06	0.05	<.001
<i>Univariate tests music listener groups</i>					
Daily listening time	2	987	28.21 (3.92)	0.05	<.001
Pop	2	987	0.20 (0.64)	0.00	.820
Urban	2	987	12.94 (0.87)	0.03	<.001
Elite	2	987	2.78 (0.69)	0.01	.063
Dance	2	987	5.19 (1.01)	0.01	.006
Rock	2	987	5.18 (1.20)	0.01	.006
<i>Internalising problems and emotions during listening</i>					
<i>Multivariate tests</i>					
Music listener groups	10	1976	21.21	0.10	<.001
Gender	5	987	15.75	0.07	<.001
Educational level	5	987	0.91	0.01	.476
Age	5	987	1.65	0.01	.145
<i>Univariate tests music listener groups</i>					
Withdrawn	2	991	16.73 (0.59)	0.03	<.001
Anxious-depressed	2	991	11.93 (0.71)	0.02	<.001
Sad	2	991	10.38 (0.82)	0.03	<.001
Anger	2	991	14.52 (0.85)	0.02	<.001
Positive affect	2	991	64.37 (0.31)	0.12	<.001

Note: A partial eta-squared between .01 and .06 reflects a small effect size, a partial eta-squared within the .06-.13 range concerns a medium effect size, and a value of .14 or higher represents a large effect (Cohen, 1988a).

^a Values between brackets represent mean square errors.

A *MANOVA* was employed to investigate differences by music listener group in terms of time spent listening (daily) and music preferences (see table 4), while controlling for gender, age, and educational level. All main effects were significant, and there were no significant interactions. A second *MANOVA* was employed to investigate differences by music listener

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group in terms of reported affect during listening and internalising problems (see table 4), while controlling for gender, age and educational level. Age and educational level were not significant, while music listener group and gender were highly significant. There were no significant interactions.

Time spent listening, music style preferences, internalising problems and emotions during listening by music listener groups

Time spent listening and music style preferences differed by music listener group-membership (see table 5). High-involved listeners spent most time a day listening to music ($p < 0.001$), i.e. more than 2 hours a day, the medium-involved listened between 1.5 and 2 hours a day, and the low-involved listened less than 1.5 hrs a day. Overall, the styles Dance and Rock were rated below the neutral midpoint of the scales, that is, towards negative ratings. Pop and Urban were clearly most popular. Liking ratings of Pop and Elite music did not distinguish significantly between the three music use groups. The high-involved group gave higher ratings to the styles Urban ($p < 0.001$) and Dance ($p < 0.01$), compared to the medium-involved. Compared to low-involved, the medium-involved group was more positive regarding the Rock style ($p < 0.01$).

Table 5 also displays the estimated means of the music listener groups on the internalising problems and emotions during listening measures. Overall, the mean score of all respondents together, as well as those of music listener groups, were below the neutral midpoint of the scales measuring negative affect (sad and angry) and internalising problems. The means overall and by group were above the neutral midpoint of the scale positive affect during listening. Music listener groups differed distinctively on these measures. The three groups differed in terms of sad affect during listening, which the low-involved experienced least, the high-involved group somewhat more often, and the medium-involved group most. Angry affect differed between the low-involved, scoring lowest, and the high-involved and medium-involved scoring higher. Regarding withdrawn behaviours, the medium-involved scored highest. On the anxious-depressed scale the difference between the groups was significant with the low-involved scoring lowest and the high-involved and medium-involved scoring higher. In terms of positive affect during listening, the difference between the music

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listener groups was most pronounced. The group high-involved scored highest on this scale, with the low-involved least, and the medium-involved in the middle range of the group scores.

Table 5

Estimated means (S.E.) of the music listener groups on daily listening time, music style preferences, internalising problems and emotions during listening

	High- involved	Medium- involved	Low- involved	All
Daily listening time	5.37 ^a (.14)	4.34 ^c (.07)	3.53 ^b (.26)	4.42 (.10)
Pop	3.21 (.06)	3.17 (.03)	3.20 (.10)	3.19 (.04)
Urban	3.42 ^a (.07)	3.04 ^b (.03)	3.20 ^{a,b} (.12)	3.22 (.05)
Elite	3.03 (.06)	2.91 (.03)	2.77 (.11)	2.92 (.04)
Dance	2.95 ^a (.07)	2.69 ^b (.04)	2.75 ^{a,b} (.13)	2.80 (.05)
Rock	2.78 ^{a,b} (.08)	2.91 ^b (.04)	2.46 ^a (.14)	2.72 (.06)
Angry affect	1.92 ^a (.06)	1.97 ^a (.03)	1.41 ^b (.12)	1.77 (.05)
Sad affect	2.00 ^a (.07)	2.18 ^c (.03)	1.57 ^b (.12)	1.92 (.05)
Positive affect	4.18 ^a (.04)	3.79 ^c (.02)	3.32 ^b (.07)	3.76 (.03)
Withdrawn	2.17 ^a (.06)	2.45 ^b (.03)	2.00 ^a (.10)	2.21 (.04)
Anxious-depressed	2.52 ^a (.06)	2.48 ^a (.03)	1.95 ^b (.11)	2.32 (.04)

Note: Daily time spent listening was measured on a scale ranging from 1 (<30 minutes); 2 (30-60 minutes); 3(1-1.5hrs.); 4 (1.5-2hrs.); 5 (2-4hrs.); 6(4-6hrs.); 7(6-8hrs.); 8(>8hrs). Scores on music style preference, Withdrawn, Anxious-depressed, and Affect scales represent means (and standard deviations) on Likert-type scales ranging from 1 (dislike strongly, or does not apply) to 5 (like very much, or applies completely). Where superscripts differ, group differences are significant at $p < .01$. Group-based differences were tested for in pair-wise comparisons, using the Bonferroni correction for multiple comparisons.

Discussion

This study aimed to readdress and extend previous research on music listenership by creating a typology of music listeners based on a scale measuring involvement with music and four scales assessing music use. In order to create a useful typology of music listeners one scale was constructed to measure involvement with music, while four scales taxed differing forms of music use. Music listener groups were subsequently compared in terms of daily time spent listening, music preferences, emotions during listening, and internalising problems, while controlling gender, age, and educational level.

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Music listener groups

Constructing a typology of music listeners by means of latent class analysis (McCutcheon, 1987) resulted in distinguishing three groups. One group was characterised by an intense involvement with and use of music. This group constituted roughly one fifth of the sample. They were labelled high-involved, as of the three groups they rated all five scales most positively. This group reported the highest daily listening time, i.e., over two hours a day, and thus corroborated their highly positive attitudes towards music involvement.

The second group, labelled medium-involved, was positive about the uses of music in terms of good vibes and coping, albeit not as positive as the high-involved group. Among this group identification with lyrics and artists was rated neutrally, and music involvement mildly positively. This concurs with the findings reported by North, Hargreaves, and Hargreaves (2004), who used the experience sampling method to tax everyday uses of music listening, among 346 English residents aged between 13 and 78 over 14 days. This method entailed the use of pagers, to alert participants at different times of the day and in different situations to fill in questionnaires regarding their current music listening, or the music listened to since the last text message, and their motivations for doing so. Most listening was aimed at mood-optimisation and used so rather casually. Deep emotional involvement with music is much rarer and only employed by a specific and relatively small group as our findings corroborate.

The third group labelled low-involved consisted of a small group (only 6.1% of the sample) that was only positive about using music for good vibes, while neutral towards music involvement, and most negative towards identification and friendship criterion. Previous studies aimed at constructing groups based on music preferences alone similarly found a relatively small group of people low-involved with music (Mulder et al., 2007; Ter Bogt, Raaijmakers et al., 2003). Our findings indicate that this small group of music listeners merely uses music as auditory wallpaper. They spent least time a day listening to music.

Music preferences and emotional functioning by music listener group

Across the three groups, the most popular styles were Pop and Urban, followed in descending order by Elite, Dance and Rock. The high-involved were more positive towards Urban and Dance than the medium-involved. The medium-involved were more positive towards Rock compared to the low-involved. The low-involved were as unenthusiastic in terms

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of music liking ratings as they were regarding music uses. This group only stood out in terms of the lowest ratings of Rock genres.

Based on previous studies in the literature, it could be expected that a high use of music in terms of coping relates to higher levels of emotional distress in general. This is suggested by the findings of studies on heavy metal fans who used their music of choice as a positive source of identification and as a therapeutic tool in coping with internalising distress (Arnett, 1996; Lacourse et al., 2000). Martin, Clarke and Pearce (1993) reported that adolescents and young adults feeling sad *after* listening were at higher risk for depression, delinquency, drug use, and suicidal thoughts. Thus, it could be that using music for coping with distress inadvertently results in sustaining negative states.

However, in this study the group with the highest use of music for coping, the high-involved, did not report experiencing sad or angry affect more often during listening. Although all three groups indicated that they did not frequently experience negative affect during listening, the high-involved reported this less often than the medium-involved, with the low-involved least. The same was found for levels of anxious-depressed symptoms. In terms of withdrawn behaviours, the high-involved scored significantly lower than the medium-involved group. Therefore, in this sample, the group that most frequently reported using music for coping with distress was not more troubled or more likely to experience negative emotions during listening. Rather, they reported more positive affect than any of the other groups.

The positive emotional profile of this high-involved group fits well with their music preferences in terms of broad styles, that is, they were most positive towards Urban and Dance genres. Both types of music are not known for their dark content (as opposed to heavy metal), but rather can be characterized for their vibrancy and energising potential (Ter Bogt, 2002; Ter Bogt, 2008). In a study relating music preferences to personality characteristics, Rentfrow and Gosling (2003a) labelled Dance and Urban music as energetic and rhythmic, and found a positive relationship with the personality traits extraversion and agreeableness. Therefore, a deep or high level of involvement with music is not necessarily a sign of trouble. Rather, the high-involved can be regarded as life artists who have discovered how to use music both to help them through life, as well as to enrich their lives.

The majority of music listeners, the medium-involved group, were more positive towards Rock compared to the other two groups. They scored higher on withdrawing

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behaviours (although their average was still below the neutral category of the scale). Interestingly, the low-involved reported the lowest levels of internalising problems and negative affect during listening, but they were also less likely to experience the benefits from music listening. That is, even though they were quite positive about using music for good vibes, they were neutral on experiencing positive affect.

Taken together, our findings suggest that among ‘normal’ music listeners, music is a benign and positive part of their lives. Previous research on troubled, alienated youth indicated that although music listening provides immediate and gratifying experiences it can also conform and sustain negative states. The conditions under which music listening has unwanted effects remain to be identified further.

Limitations

Although we were able to paint an overall picture, our data did not allow for testing of mechanisms underlying the associations between patterns of music use, emotions during listening and internalising problems. That would require more detailed information on how much time is spent listening alone, which music is listened to when in specific moods, and whether music listening actually results in more positive states, or sustains existing negative ones. More detailed questioning would be necessary, if not more naturalistic monitoring of ongoing processes. For instance, Chen, Zhou, & Bryant (2007) designed an experimental study on the use of music in mood repair. Their findings showed that individuals differ in the timing of processes that will either help find consolation (e.g., through recognising sadness in music), or that will help resolve and divert negative feelings (e.g., through upbeat music).

Interestingly, the age range in this sample was twelve to twenty-nine, but age did not discriminate among groups of music users, nor did educational level. Therefore, our findings indicate that the importance and personal profile of music listenership extends from early adolescence into young adulthood, and transcends educational strata.

In conclusion, for most people music listening serves the purpose of creating ‘good vibes’. For a small group, this is the only use music has. For a completely different and select group, music is very central in life, and it serves atmospheres, moods, and self-identity. In addition, this group uses music for coping with distress, but is not necessarily more troubled. On the contrary, to them music may be a healthy and positive piece of ‘equipment for living’

(Christenson & Roberts, 1998a). The potential of music to enrich life certainly calls for further investigations into its uses and effects.

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Study 5 – Typology of music users

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GENERAL DISCUSSION

General discussion

The aim of this thesis was to supplement existing literature on the relation between music preferences and psychosocial problem behaviours of adolescents and young adults. In our studies, the correlates of a large number of music genre preferences were investigated. The problem behaviours studied included substance use, and externalising and internalising behaviours. Substance use behaviours concerned cigarette, alcohol and cannabis consumption. Externalising problems comprised aggressive and delinquent behaviours, and substance abuse. Internalising problems consist of somatic complaints, symptoms of anxiety and depression, and withdrawal behaviours (Achenbach, 1991). All studies were based on surveys filled in either at schools by adolescents (studies 2-4, age range 12-17 years) or on the internet as part of a panel (studies 1 and 5) by both adolescents and young adults (age range 12-29 years).

The assessment of the consistency of music taste within individuals has not been examined closely in literature on popular music. Previous studies of musical taste have been cross-sectional in nature, providing frozen snapshots of the intra-individual consistency of music taste over time. This study used a longitudinal design assessing intra-individual consistency of music preferences in terms of favourite artists and genre ratings (study 1).

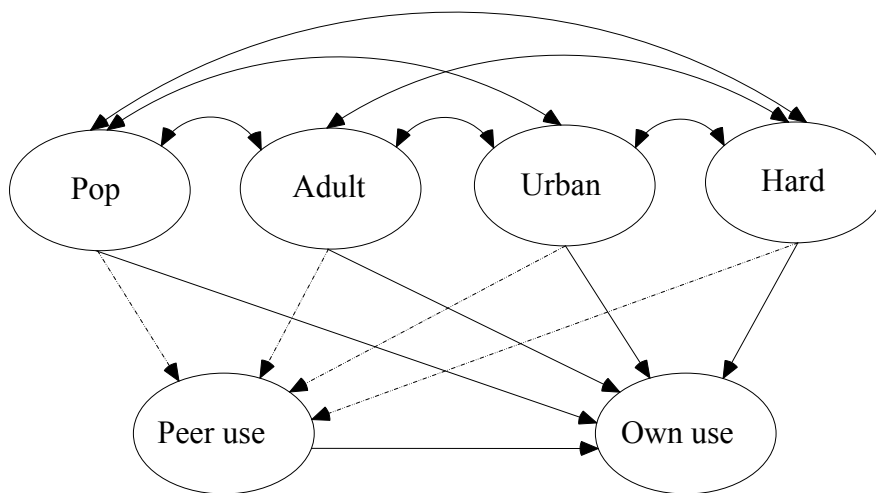
Most studies are characterised by the use of samples of limited size. The relatively small scale of previous research made it necessary to dichotomize music preferences into Mainstream versus non-Mainstream. However, adolescents make far more varied distinctions in terms of music tastes. In our studies we investigated the link between music preferences and problem behaviours on the scale of epidemiological research programs (studies 2-4). This ensures representation at the national level and enables inclusion of a wide range of music preferences. The size of the studies also facilitated inclusion of a set of factors that are relevant to both music preferences as well as problem behaviours. Examples of these factors are: gender, age, socio-economic status, and educational level. Other relevant confounds were added such as perceived school achievement and social support from parents and friends. In the study on music taste and substance use the factors ‘perceived parental’ (study 2) and ‘peer use’ (studies 2 and 3) were also included. In addition, most studies on the subject of music taste and problem behaviours have been investigated in English speaking countries. Our studies extended findings to a non-English speaking country.

Although associations have been found between music preferences and problem behaviours, most studies have not probed into the mechanisms that explain this connection. In

our study we have tried to model the relationships between music taste, substance use, and behaviour of peers (study 3). That is, both music preference and substance use behaviours are to a certain degree shared among friends. Therefore, we aimed to answer the question whether or not the connection between music taste and substance use is actually mediated by peers' substance use? To this extent, relationships between all three components were modelled simultaneously (see figure 1).

Figure 1

Music taste, self-reported substance use, and the hypothesized mediation role of peer use



The final contribution of this thesis lies in the use of the typological approach with regard to both music taste (study 4) and music uses (study 5). This methodology combines the positions of two basic approaches, i.e., the variable-centred and case-centred approach (Jessor, 1998; Mandara, 2003). The variable-centred approach consists of analyzing patterns of variables across samples of adolescents. A drawback to this approach lies in the loss of idiosyncratic differences between individuals. The case-centred approach focuses on one case at a time, arguing that reality is too complex to be captured by linear models applied to large groups. However, where the variable-centred approach is hampered by limited understanding of individuals, the case-centred approach is limited in its ability to provide generalizations.

Typological methodology overcomes these shortcomings by combining both approaches. Constructing typologies ensures that respondents are positioned in groups, based on their similarities and differences. That is, individuals are classified into groups with similar

characteristics. These groups are then analysed for differences. The classification of individuals into groups maximizes sensitivity to individual choices, while sufficient numbers of cases in each group ensures general findings, making complex social realities graspable.

The typological approach was applied to two topics in this thesis. First, music taste groups were formed based on patterns of likes, dislikes, and neutrality regarding a number of genres (study 4). Next, the music taste groups were compared in terms of problem behaviours. Second, music use groups were constructed based on patterns of music use (study 5). Next, the groups were analyzed for differences regarding time spent listening, emotions during listening and internalising problems.

Summary of the main findings

Music preferences

The conceptualization of music preferences was central to this thesis. The music field that listeners can choose from is varied and complex. The large scale survey-based nature of the studies in this thesis demanded a structuring of the music field to obtain music taste assessments in a systematic way. This entailed dividing the rich and varied musical landscape into convenient yet comprehensive categories. These range from the rough division of Pop versus Rock, to more detailed genre segmentations. Music genres and their labels have emerged through an interplay between musicians, listeners, media, and the music industry (Frith, 1996; Negus, 1999). Labels such as rap/hip hop, rock, hard rock, dance, or soul refer to broad categories in which artists are filed. Participants were asked to rate a wide range of genres on ordinal scales in terms of preference. For each genre, they were given a separate option to indicate ‘not knowing this type of music’. For instance, in study 4 this option was used to form a group consisting of people with little knowledge of music.

Genres constitute distinctive music types, but they are not unrelated. Factor analysis on the preference ratings revealed which genres tended to be viewed as related, and which were not. In this study, a group of related genres is referred to as a music Style. The Styles discerned in factor analysis represent latent constructs. That is, a Style is merely a common denominator of related genres. In the text below, genres will be referred to using lower-case letters, while Styles will be referred to using upper-case letters (e.g., dance and Dance). As an example of the

approach taken to measuring music taste Table 1 displays the genres used in the first study in this thesis, classified by Style.

Table 1
Overview of genres classified by style (taken from study 1)

Rock	Urban	Dance	Pop	Elite
rock	rap/hip hop	dance	top 40	soul/r&b
hardrock	r&b	trance	ballads	lounge
alternative	reggae	techno	Dutch pop	singer-songwriter
punk	dancehall	electro	Latin	jazz
gothic		hardhouse	boybands	classical music
heavy metal				

Consistency of music preferences

Although many studies showed the relevance of music preferences in explaining adolescent problem behaviours, no study has assessed how consistent individuals are over time in their preference ratings. Rentfrow and Gosling (2003) and Delsing et al. (2008) did measure the consistency within a sample of individuals over a three week and a three year period, respectively. However, these studies assessed the consistency of the *samples* in their preference ratings, rather than the consistency of the *individuals* that make up the sample. In other words, their ‘consistency measures’ reflected the predominantly consistent ratings of music styles over time by the sample as a whole. Of greater relevance to the psychosocial study of music taste would be the consistency in ratings as displayed by individuals. Study 1 aimed to complement the literature on the consistency of music preference ratings by assessing intra-individual choices.

To this extent, an internet-panel of twelve to twenty-nine years olds was followed over a period of 21 months. At three points in time, respondents were requested to list their top three favourite artists, and to rate a wide range of genres (see table 1). The intra-individual consistency in ‘favourite artists listing’ was determined using a count and divide procedure. The consistency in ratings of genres was measured using the *q*-correlation technique, which indexes pattern comparability within respondents, as opposed to the more ubiquitously used Pearson’s correlation coefficient which indexes pattern comparability *across* respondents (Cronbach & Gleser, 1953; Dahlstrom & Humphrey, 1996; Roberts, Caspi & Moffitt, 2001; Van Aken, Van Lieshout & Haselager, 1996).

General discussion

At the intra-individual level, taste consistency varied from inconsistency to near perfect consistency. Overall, however, the majority of adolescents and young adults display high consistency in their preferences for music broadly divided into Styles, and moderate to high consistency at the genre level. Most participants displayed relatively low consistency with favourite artists, which increased somewhat with age (from 21% to 39% overlap in artists mentioned). It was concluded that musical taste in terms of genre and Style ratings is surprisingly consistent even for the age-group twelve to seventeen, and is even more consistent among older youth and young adults.

Music taste and substance use

A connection between substance use and preferences for heavy metal, rap, reggae, and electronic dance music had previously been established (Arnett, 1991; Chen, Miller, Grube & Waiters, 2006; Forsyth, Barnard & McKeganey, 1997; Miranda & Claes, 2004; Ter Bogt & Engels, 2005). Study 2 reported the gender-specific links between ‘last month’ tobacco and alcohol use, and a wide range of music genres in a nationally representative sample of adolescents (n=7,324) aged twelve to sixteen. Factors associated with both music preferences and substance use were included in the analysis to test for the uniqueness of music taste in connection to substance use behaviours. These co-associated factors (covariates) were: age, school-level, perceived school achievement, household composition, social support from parents and friends, and finally, perceived parental and peer substance use.

While prior research showed that liking heavy metal and rap predicts substance use, a logistic regression analysis showed that, for some types of substance use, the opposite was found. That is, a preference for heavy metal was associated with less smoking among boys. Among girls, heavy metal preference ratings were initially negatively associated with last month alcohol use, and ratings of rap/hip hop were associated with less smoking. These associations were redundant when the covariates were added to the model for girls. Preference ratings of punk/hardcore and techno/hardhouse were consistently positively related to substance use. In addition, liking reggae was related to higher alcohol use among males, and house/trance to more alcohol and smoking among girls. Genres consistently negatively associated with substance use were jazz and classical music. Preference for chart-based music was also negatively associated with substance use.

General discussion

Music preferences were uniquely associated with substance use after controlling for important confounders. Inclusion of the covariates reduced the explanatory power of music preferences. A large portion of the variance in substance use prevalence was clearly linked to the perceived number of peers using substances. This raised the question of ‘mediation’ (Baron & Kenny, 1986). That is, it could be that the association between music taste and substance use is, in fact, spurious and stems from peer group behaviour and the ensuing similarity in behaviour by the test subject. Therefore, in the next study a different approach was taken to model the concurrent associations between music preferences, self-reported substance use and perceived number of peers using substances. The technique used in study 2 (logistic regressions) did show the associations between music preferences and substance use, as well as those between perceived number of peers using substances. However, it did not show the association between music preference and perceived number of peers using substances. Structural equation modelling (SEM) enabled testing all three relationships.

Mechanism explaining the link between music preferences and substance use: The role of peers

To a large extent, both music taste and substance use are shared among friends (Knobloch, Vorderer & Zillmann, 2000; Maxwell, 2002; Ter Bogt, 2004, 2008). To test for the uniqueness of peer behaviour and music preferences in explaining adolescent substance use an inclusive model was constructed detailing the simultaneous relationships between music preferences, self-reported substance use and perceived number of peers using substances (study 3). The same data as in the previous study was used. Structural Equation Modelling was employed to investigate the extent to which music preferences are mediated by peer behaviour in explaining adolescent substance use (see figure 1). Music preferences factored into four styles: Pop (chart music, Dutch pop), Adult (classical music, jazz), Urban (rap/hiphop, soul/r&b) and Hard (punk/hardcore, techno/hardhouse). Substance use was modelled as two latent factors for self-reported and perceived number of peers using substances. Both factors were indexed by prevalence ratings regarding tobacco, alcohol and cannabis consumption.

The hypothesized mediation mechanism was partially confirmed and direct associations between music taste and self-reported substance use remained. Preference for Urban music was positively associated with self-reported substance use, and this was entirely attributable to perceived number of peers using substances. The associations between the other music types

and substance use remained directly relevant in explaining substance use, and perception of substance use by peers. Specifically, ratings of the style labelled Hard were positively associated with substance use, both directly and via peers. Conversely, ratings of Pop and Adult-oriented music were negatively associated with substance use, both directly as well as indirectly. The relationships did not differ substantially or significantly between groups based on gender or age.

The typological approach

Music preference consists of a conglomerate of liking, disliking, and neutrality towards a wide range of genres. The specific pattern of liking, disliking, and neutrality can be expected to differ among individuals. At the same time, music taste is sufficiently socially organised for individuals to cluster in terms of their relative likes and dislikes. Therefore, in study 4, the typological approach was used to identify groups of individuals with similar preference patterns regarding different music styles. Table 2 displays the music taste groups identified in study 4.

Table 2
Taste groups (% of total N) and their relative appreciation of music styles (relative to the sample's mean of the preference ratings of the supposed music style)

	Pop-Dance	Urban	Rock	Elite
1. Middle of the Road (18.1)	+/-	-	-	-
2. Urban (20.2)	+/-	++	-	+/-
3. Exclusive Rock (1.9)	-- ↓	--	++	--
4. Rock-pop (32.4)	+	+/-	+	-
5. Elitist (7.5)	-	-	-	+
6. Omnivores (13.9)	++	++	+	++
7. Low Involved (6) ^a				

^aThis group had indicated knowing very few of the music genres presented for ratings and therefore their ratings of the genres are not displayed

Music preference ratings were obtained from a high-school based sample of 4,159 adolescents, representative of Dutch youth aged 12 to 16. The genre ratings factored into four styles, i.e., Rock, Urban, Pop-Dance and Elitist. Using hierarchical cluster analysis, seven taste groups were distinguished. One group was characterized mostly by relatively little knowledge of music genres and therefore labelled 'Low-involved'. The other groups were labelled for their most preferred type of music. These were Exclusive Rock fans, Urban fans, Rock-Pop fans,

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Elitist (only somewhat positive towards classical music and jazz), a Middle-of-the-Road group (MOR group), and Omnivores. The associations with measures of problem behaviours are described below.

The typological approach was also used to investigate how music listeners cluster together in terms of music uses (study 5). Studies on the uses of music have generally come up with the ubiquitous use of music to alleviate boredom, and to make mundane chores more pleasurable to do. Other uses are more cognitive, such as focusing on lyrics for purposes of identification and recognition, or more social, such as improving the atmosphere when with others. This is by no means an exhausting list of uses, but the point is that different types of music use can be distinguished. Previous survey-based research on uses of music has therefore focused on which *uses* cluster together and how popular they are among people. Based on studies of a more ethnographic nature people can be expected to differ in the engagement with different music uses.

Therefore, study 5 was conducted to investigate how music *listeners* cluster together in terms of music uses and to what extent these groups of music listeners embrace the different music applications.

Participants aged twelve to twenty-nine filled in questionnaires on the internet (n=997). Five scales were constructed to measure music uses. The first scale measured music involvement in terms of frequently talking about music with friends. The next four scales measured the use of music for good vibes, for coping with distress, for identification with lyrics

Table 3
Profiles of music listener group (% of sample)

	Music involvement	Good vibes	Coping	Identification	Friendship criterion
High-involved (19.7)	++	++	++	+	-
Medium-involved (74.2)	+	+	+	+/-	-
Low-involved (6.1)	+/-	+	-	-	--

Note: Group-based levels on the scales are relative to the scales' neutral midpoints (that is, not affirming and not disconfirming using music in such ways)

and artists, and as a friendship criterion. Latent Class Analysis (LCA) was used to identify groups. Classifying participants into three groups proved an optimal classification based on fit measures and a sufficient number of respondents in each group. Table 3 displays the identified music use groups. The three groups were labelled: high-involved, medium-involved and low-

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involved, using the mean scores as cues. The associations with emotional measures are described below.

Behavioural characteristics of the groups: externalising and internalising problem behaviours

The music taste groups reported in study 4 were analysed for differences in terms of problem behaviours as measured by the Youth Self-Report (YSR) (Achenbach, 1991). After controlling for gender, age, parenting, school, and peer variables, music taste groups appeared uniquely associated with problem behaviours. The Exclusive Rock, Rock-Pop and Urban fans scored higher on the externalising of problem behaviours. The taste groups Elitists and the Exclusive Rock fans scored higher on the internalising side of problem behaviours. The Omnivores scored high on both types of problem behaviours. Belonging to the MOR group was negatively associated with problem behaviours.

In study 5, music use groups were investigated for differences regarding time spent listening, music taste, internalising problems, and emotions during listening after controlling for gender, age and educational level. The low-involved group of music listeners appeared to use music merely as auditory wallpaper, and did not experience strong emotions during listening. This group constituted a minority (6.1% of the sample). The majority of listeners (74.2%) used music in a variety of positive ways (medium-involved), and there was a group intensely involved with music (19.7%). In line with their labels, the high-involved listened most (over 2 hours a day), the medium-involved somewhat less (between 1.5 and 2 hours a day), and the low-involved spent less than one and a half hours a day listening to music. Across the three groups, the most popular styles were Pop and Urban, followed in descending order by Elite, Dance and Rock. The high-involved listeners were most positive towards music styles, and specifically towards Dance and Urban styles. The medium-involved were more positive towards Rock compared to the low-involved, and least positive towards Urban and Dance compared to the high-involved. The low-involved therefore only distinguished themselves in terms of the low appreciation of Rock compared to the medium-involved.

It has been suggested in the literature that using music for coping with problems could result in sustaining negative states rather than resolving them (Martin, Clarke & Pearce, 1993). Our study did not corroborate this. Although the high-involved group embraced using music for coping with distress most, they also reported high levels of positive affect and low levels of

negative affect during listening, and did not report higher levels of internalising problems. It was concluded that those highly involved with music can be considered life artists who know how to use music to enrich life.

Elaborations of the Main Findings

Social meanings

In integrating the findings of the studies in this thesis, it is helpful to recognise the similarity in terms of signalling defiance of adult-established rules by means of music preferences, substance use, and externalising problem behaviours. That is, among adolescents both substance use and externalising behaviours involve transgression of adult-established rules. Such transgression is appealing, mostly to adolescent males, and is related to age period. For instance, from early adolescence onward, the peer culture becomes more important, as does music (e.g., Frith, 1983; Ter Bogt, 2004). Concurrently, externalising behaviours increase in prevalence after the onset of adolescence, reaching a peak around the age of sixteen (Steinberg & Silverberg, 1986), and declining again from late adolescence to young adulthood (Overbeek, 2001). Music preference is similarly a useful tool in signalling transgression of adult-oriented values.

In study 4, the Urban, Exclusive Rock, Rock-Pop, and Omnivores scored relatively higher on externalising problem behaviours, compared to the Low-Involved, Elitist and MOR groups. These four taste groups share a preference for two distinct music styles that have one thing in common. That is, both hip hop and the harder forms of rock project adult-defiant images. A certain degree of rebelling against adult authority is relatively normal during adolescence, and the Urban and Rock fans seem to synchronize their music preferences with their behavioural inclinations. These types of music offer strong cultural identities, especially in the case of the more extreme forms of music within these types (e.g., gangsta rap, death metal) (Miranda & Claes, 2004).

Our substance use studies found similar associations with music taste. Earlier research had reported preferences for heavy metal and the defiant hip hop music known as 'gangsta rap' as risk factors for substance use (Arnett, 1991; Miranda & Claes, 2004). In this study, other types of music surfaced as overall risk factors for smoking or drinking; punk/hardcore, techno/hardhouse and reggae. These genres differ wildly musically. Punk/hardcore lies within

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the rock spectrum. Techno/hardhouse is electronic dance music and reggae is an offspring of Afro-Caribbean music. However, all these genres have a certain off-mainstream appeal in common. It seems that punk/hardcore has replaced the position heavy metal once had in terms of relatedness to deviant behaviours. This either reflects a cross-cultural difference or a time-based shift, as our studies took place in 2001 and 2003, while the American and Canadian studies reporting on heavy metal took place in the eighties and nineties.

Techno/hardhouse music can be characterized as fast and minimalist, due to a monotonous bass beat, few, if any lyrics, and an exclusively electronic sound. It is at the extreme of loud and energetic dance music, typically favoured more by males. Punk/hardcore is a loud and oppositional form of rock music, sometimes with a politically radical orientation, yet it also appears in a somewhat polished version in the charts, and even there remains oppositional, at least in image. Reggae has historically been associated with Jamaican social-religious opposition, but has been popularized worldwide. The term reggae hints at a subculture, known for glorifying marijuana as a means to gaining ‘knowledge’. Overall, it seems that genres with non-mainstream, youth-oriented pop appeal attract listeners who are also more likely to consider behaviours such as smoking and drinking “cool” (Spijkerman, van den Eijnden & Engels, 2005). Preference for music that is either mainstream (pop), or adult-oriented (classical music) are negatively associated with substance use. Why adolescents prefer certain social meanings over others is explained in the next section.

(Re)active adaptation

The need for identifying with non-mainstream symbolic universes can be explained by reactive adaptation in the face of adverse developmental circumstance. For instance, music preferences as well as problem behaviours have been related to adverse family circumstances (Lacourse, Claes & Villeneuve, 2000), or a problematic relation to the school system and society in general (Arnett, 1996; Roe, 1992, 1995). Both music preferences and the behavioural acting out of aggression and frustration, function as tools to cope with a perceived outsiders’ position (Arnett, 1996; Weinstein, 2000).

The relationship between internalising problems and music taste has similarly been described as co-occurring with troublesome family relations, alienation from the school system and society at large (Arnett, 1996; Lacourse et al., 2000). The other groups with relatively high

internalising problem scores were the Elitists and the Omnivores. The music taste of the Elitists reflects an adult-oriented mindset, which seemingly should be associated with well-being. However, it could be that their music taste placed them outside the peer culture, thereby causing distress. Or, their distress caused them to be drawn to music that is at the same time complex, reflexive, and full of comfort (Rentfrow & Gosling, 2003; Ter Bogt, 2004). The Omnivores, with their broad music taste and higher scores on both externalising and internalising problems seem to need the comforting and expressive uses of music most.

We included a representative range of such developmental circumstances as confounders, but music preferences remained uniquely associated with internalising and externalising distress. Also, possible adverse developmental circumstances had been taken up in the model analysed in study 4, and music taste remained uniquely associated with problem behaviours. Therefore, an additional explanatory concept is needed.

Sensation seeking & openness to experience

The identification with harder cultural forms can be further explained by a personal disposition to seek intense experiences and sensations. This disposition is known as sensation seeking, and has been related to both music preference (Arnett, 1991; Litle & Zuckerman, 1986), e.g., a preference for an exaggerated bass (McCown, 1997) and complex music (Dollinger, 1993), as well as to risk-taking behaviours such as alcohol use (Arnett, 1991; Chen et al., 2006; Yanovitzky, 2006; Zuckerman, 1994).

The personality dimension ‘sensation seeking’ has been well studied and validated. The most widely used categorisation of personality dimensions is known as the Big Five. These are neuroticism, extraversion, agreeableness, conscientiousness, and openness to experience. Sensation seeking relates to these as a subset of the trait extraversion (Dollinger, 1993), as this trait encompasses the degree to which individuals engage in impulsive acts, among others. Dollinger (1993) suggested the Big Five equivalent most useful in explaining music preferences is the trait labelled ‘openness to experience’. Openness to experience refers to the degree of “preference for variety versus sameness in life experience.” (p. 73, Dollinger, 1993). A high degree of openness with regards to music listening is related to the ability to become absorbed in music (Dollinger, 1993). Absorption is a trait that taps into the ability to lose oneself in music (Kreutz, Ott, Teichmann, Osawa & Vaitl, 2008).

General discussion

Rentfrow and Gosling (2003) studied the relationship between different music preferences and personality traits. They distinguished between intense, rebellious music and reflective, complex music (in addition to the distinctions between upbeat and conventional versus energetic and rhythmic music). Preference for reflective and complex music was strongly related to openness to experience. In our study, the Elitists and Omnivores were open to complex, reflective music and diverse types of music respectively. Moreover, the Exclusive Rock fans can be expected to be high on sensation seeking, as this taste group seems to prefer loud and non-mainstream music most. In addition, exclusive Rock fans can be expected to appreciate heavy metal, a genre which may have a working-class, simplistic image (Bryson, 1996; Roe, 1992), but some of its most devoted musicians are academically trained (Weinstein, 2000) and some heavy metal music can be characterised as musically ingenious. These apparently disparate taste groups can therefore be expected to be high on openness to experience.

Personality concepts were not available in our studies, but it may be clear from the discussion above that the processes occurring during music listening are important in explaining the relationship between music taste and problem behaviours. Whether music preference concerns loud or complex music or both (Exclusive Rock fans, Omnivores, and Elitists), these music listeners seem to need mood-management most. Therefore, our final study focused on the importance of music and the uses that listeners put music to. Following the typological approach, music listeners were grouped by levels of music involvement and music uses. Next, the identified groups were compared in terms of time spent listening, music taste, internalising distress and emotions during listening.

The uses that listeners put music to

Involvement with and uses of music should be taken into account when conceptualising the relationship between music taste and psychosocial functioning (Frith, 1981). That is, a high involvement with music is likely to go hand in hand with more versatile uses of music. Study five was applied to music listeners grouped by degree of involvement with music and patterns of music use. Next, groups were compared in terms of time spent listening, music taste, internalising problems and emotions during listening.

General discussion

Study five examined the relationship between involvement with and uses of music on the one hand and emotional distress on the other. This was done by checking for a possible positive relationship between using music for coping with distress and internalising problems. Constructive as this type of coping may sound, it has been suggested that such coping could result in sustaining negative states during listening (Martin et al., 1993). However, the group most involved with music –socially, personally, emotionally- did not indicate experiencing negative affect during listening more than groups less intensely involved with music, nor did they report higher levels of internalising problems. Their high level of positive affect experienced during listening suggests this group uses music to enrich life, rather than to wallow in negative states.

As corroborated in previous research on uses of music, music listening - independent of specific music preference – for the largest part serves for relaxation, diversion, energising, and setting the right atmosphere when alone or with others. Approximately one fifth of our sample in study 5 strongly embraced statements regarding the use of music for coping with distress. This group was also highly involved with music in general, and indicated recognizing themselves in artists and their lyrics. The high levels of positive and low levels of internalising problems and negative affect fit their most pronounced music preferences, that is, Urban and Dance. The mainstream version of Urban music, i.e. r&b and rap, is mostly concerned with romantic themes and material matters, such as looking good. Dance music is made not so much for deep reflection, as it is mainly the rhythmic aspect that is most important. It is associated with partying and going out, or unobtrusive, upbeat stimulation during such activities as driving (Rentfrow & Gosling, 2003; Ter Bogt, 2002). The high level of positive affect during listening indicated by the group most involved with music, confirms the beneficiary role played by music listening.

Integrating the findings: Socialisation theory

Although most of the following discussion focuses on adolescents, our studies on the consistency of music taste and on the typology of music listeners in terms of music uses did not indicate any exclusivity of the importance of music taste to adolescence. Rather, the relevance extends into young adulthood as well. However, most of the studies in this thesis that focused

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on the relationship between music preferences and problem behaviours were based on samples consisting of adolescents (aged twelve to sixteen; Studies 2, 3 and 4).

Arnett's socialisation view on the relationship between music listening and adolescent functioning combines insights from Uses and Gratifications tradition with developmental perspectives on adolescence (Arnett, 1992a, 1992b; Arnett, 1996; Arnett, Larson & Offer, 1995). His theory is aimed at explaining adolescent reckless behaviour. This encompasses the substance use and externalising problem behaviours used in our studies.

Roe's theory on 'deviant media choices' and 'behavioural correlates' similarly focused on problem behaviours and music tastes (Roe, 1992, 1995). He focused on the role of school as a socialising context within which both cultural preferences and delinquent behaviours develop, given personal and familial characteristics. An unrewarding school environment can explain deviancy in terms of both media as well as behavioural choices. The deviancy helps express, make sense of, and come to terms with, a perceived deviant social position. Both theories then, emphasize the importance of music, peers, and other socialising agents in the lives of adolescents, as well as the motives for and gratifications obtained from music listening (Arnett, 1992a, 1992b; Roe, 1995).

Based on previous studies, the effectiveness of using music as a tool in mood management became questionable as some listeners appeared to inadvertently sustain negative states (Martin et al., 1993). However, study 5 indicated that the group of listeners highly involved with music and using music as a tool for coping with distress showed no signs of wallowing in negative states. Rather, they were marked mostly by a high level of positive affect experienced during listening. In addition, our study showed that a high involvement with music per se is not associated with internalising problem behaviours. The conditions under which this does occur remain to be identified further.

Study 5 corroborated the positivity of music listening in the lives of listeners, but our large-scale studies did indicate that music taste is related to problem behaviours. Developmental characteristics such as age, school and parenting variables proved similarly important next to music taste in explaining problem behaviours. Thus, our findings corroborated the uniqueness of music as a socialising agent.

An important part of the explanation of this finding lies in the social meanings of different music types and the personal characteristics of the music listener. As Arnett and Roe

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argued, different socialising agents work together in interaction with personal dispositions in creating ‘deviancy’. For instance, in the case of substance use behaviours, the associations with music taste can be explained by the culture surrounding and propagated by the music type in question, which either reflects the substance use inclinations of the listener, or helps shape them. Perceived behaviour of peers partly mediated the role of music taste in explaining substance use behaviours. However, direct effects of music taste remained. This finding indicates that music is reflective of more than peer clique norms and behaviours. Rather, music can be conceptualized as a socializing agent that transcends the immediate socializing environment, allowing for cultural tourism (Christenson & Roberts, 1998) and emotional voyaging to identifications not achievable in the here and now.

An important aspect of the social meanings of music genres concerns the social implications they carry in terms of popularity, or social acceptability. Different types of deviations from the mainstream centre must be distinguished. Deviations from the adolescent mainstream can be oriented towards an adult-approved mindset, such as more serious forms of music, e.g., classical music. Conversely, deviations can follow the direction of a youth-cultural orientation towards more rule-breaking cultures. Interestingly, quite disparate music types can be subsumed under the header “youth-culture oriented”, or “rule-breaking”. For instance, both the youth cultures surrounding hardcore/techno dance music, and the rock-based punk/hardcore had comparable substance use associations. However, to the fans of these genres, differences are huge, and can therefore not be overlooked in studying the meaning of music to listeners.

Our study on the consistency of music taste indicated that over a near two year period (21 months) individuals are highly consistent in terms of broad music styles. In terms of genre ratings, individuals displayed moderate to high consistency, while in terms of favourite artist listings, consistency was low. The studies in this thesis linking music taste to problem behaviours relied on genre and style ratings. In explaining associations with problem behaviours, popularity statuses and related social meanings of different music genres are important. The moderate to high consistency displayed regarding genre ratings, combined with the change over the years in popularity of genres, points to the need for future monitoring studies. Not just to answer the remaining questions, but also to stay in touch with the ever-changing life worlds of youth.

Suggestions for future research

The large-scale studies two, three and four, clearly indicated that music taste is uniquely associated with adolescent problem behaviours, despite controlling important factors that also explain problem behaviours, such as relationship with parents and friends, school achievement and background factors (gender, age, educational level). Uses and Effects Theory suggests the *process* of socialisation needs to be studied in understanding the unique associations between music tastes and behaviours. This suggests that a more comprehensive approach is needed. Ideally, longitudinal monitoring of concepts taken up in the five studies of this thesis, with the inclusion of personality concepts should be undertaken.

As the mediation study (study 3) pointed out; music taste can be a binding force among adolescents in forming peer groups. It follows that taking music preference as an analytical *unity* is more sensible than analysing relationships of separate genre ratings. In addition, it follows that behaviours and attitudes of peers with similar sets of music preferences are of central importance in studying the music taste-behavioural links, as these are immediate and important socialising factors among adolescents. More precisely defined peer clique associations and the social identities and leisure activities associated with these (Eccles, Barber, Stone & Hunt, 2003; Mahoney & Stattin, 2000) should be included in future studies relating music tastes to peer behaviour. For instance, additional information is needed to help explain why the reported mediation effects were complete in the case of Urban preferences, as opposed to the partial mediation effects regarding the other types of music preferences.

Studying peer cliques could also be useful in answering questions regarding the finding that both the dance-based techno/hardhouse and the rock-based punk/hardcore carried similar substance use implications in our studies. The differences in music style between these two genres are huge, especially to the fans. Future comparative studies on peer cliques with a shared preference for either one of these types of music may enable explaining how such different music types can have such comparable associations with substance use.

In sum, longitudinal monitoring would be necessary to disentangle the processes of influence and selection of music. Factors that should be taken up in such studies are, apart from a refined assessment of music taste; music involvement and uses of music (cf. study 5), developmental predispositions (cf. studies 2-4), as well as personality constructs such as absorption (Kreutz et al., 2008), sensation seeking (Zuckerman, 1994) and openness to

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experience (Dollinger, 1993). Research designs should allow sensitivity to individual differences (see, e.g., Cairns, Cairns, Rodkin & Xie, 1998; Mandara, 2003). In addition, alternative research methods could be employed, such as experimental designs, or ethnographic studies to disentangle processes leading to associations of music tastes behaviours. The ubiquity of music, its invigorating, unifying potential, and its usefulness in coping with distress certainly warrant future studies into the processes underlying music taste and behavioural links.

WITHOUT MUSIC, LIFE WOULD BE AN ERROR

Friedrich Nietzsche [♯]

[♯] Nietzsche, F. W. (1889; 1982), p. 471. *Twilight of the Idols*. In W. Kaufmann (Ed.) *The Portable Nietzsche* (pp. 463-563). New York: The Penguin Group.

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Use it or lose it ~ Muziekvoorkeuren en gebruiksvormen van muziek gerelateerd aan psychosociaal functioneren van adolescenten en jongvolwassenen

“Muziek verziekt onze jongeren”. In navolging van die beschuldiging zijn er studies gedaan die muziekvoorkeuren relateren aan het psychosociaal functioneren van jongeren. Men vreest dat adolescenten ontvankelijk zijn voor boodschappen die promiscuïteit, middelengebruik, geweld en soms zelfs suïcide lijken te promoten. De notoire muziekgenres in dit opzicht zijn rap/hiphop en de hardere vormen van rock, zoals heavy metal en punk. Die studies zijn voornamelijk in de Verenigde Staten van Amerika uitgevoerd. De studies in dit proefschrift hebben tot doel dergelijk onderzoek uit te breiden naar Nederlandse jongeren. In voorgaand onderzoek waren de steekproeven klein en uit een beperkt gebied (een of twee scholen), en de representatie per muziekvoorkeur was beperkt. Daarnaast hadden de onderzoekers weinig gecontroleerd voor andere factoren die zouden kunnen samenhangen met muziekvoorkeur en probleemgedrag. In dit proefschrift is geprobeerd op deze punten verbetering aan te brengen. Bovendien hebben we de unieke bijdrage kunnen leveren van de bestudering van de intra-individuele consistentie van muziekvoorkeuren over tijd. Positieve effecten die muziekgebruikers ervaren worden meegenomen, door te kijken naar de verschillende gebruiksvormen van muziek en hoe zich die verhouden tot emotioneel functioneren.

De psychosociale problematiek waaraan muziekvoorkeur wordt gerelateerd, betreft internaliserend en externaliserend probleemgedrag en middelengebruik. Internaliserende problemen betreffen het naar binnen richten van negatieve emoties resulterend in angst, depressiviteit en teruggetrokkenheid. Externaliserend probleemgedrag gaat over het naar buiten richten van negatieve emoties resulterend in agressiviteit en delinquentie. Middelengebruik betreft in deze studies sigaretten, alcohol en cannabis. In drie studies waarin het verband tussen muziekvoorkeur en probleemgedrag onderzocht wordt, bestaan de populaties uit middelbare scholieren. De leeftijdsspanne beslaat dus de adolescentie. In de twee overige studies zijn jongvolwassenen ook meegenomen.

De muziekvoorkeur is in de verklaring van psychosociaal functioneren van jongeren om een aantal redenen relevant. Ten eerste zijn thema's in songteksten en muziekclips van populaire muziek relevant voor adolescenten. Denk aan ontwikkelingsthema's zoals romantiek,

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seksualiteit en identiteit. Daarnaast gebruiken adolescenten muziekvoorkeur om zichzelf en anderen te situeren in de sociale wereld. Muziek is gereedschap in de centrale taak van de adolescentie, namelijk om een identiteit te vormen. Ook vraagt de adolescentie om extra vaardigheden in het hanteren van stemmingen. Muziek is daar een probaat middel voor. Ten slotte blijkt gedragsmatig de relevantie van muziek uit een toename in tijds- en geldinvestering in muziek zodra de adolescentie begint.

Het veld van muziek waaruit jongeren kunnen kiezen, bestaat uit diverse hoofdstromingen met veel divisies. Adolescenten zijn kennis van dit veld nog aan het ontwikkelen, maar over het algemeen wordt al een gedifferentieerder onderscheid gemaakt dan pop versus de rest. In dit proefschrift wordt muziekvoorkeur op drie niveaus geconceptualiseerd. Ten eerste is gevraagd naar de waardering van genres, zoals rap, soul, trance en jazz. Op het tweede niveau zijn waarderingen van gerelateerde genres samengevoegd tot latente constructen genaamd stijlen. Gerelateerdheid is bepaald met behulp van technieken zoals factor analyse. Consistent gerapporteerde stijlen zijn een toegankelijke, melodieuze Pop stijl (betreft met name muziek die in de Top40 voorkomt), een stijl genaamd Urban (bijvoorbeeld soul/r&b en rap/hip hop vallen daaronder); elektronische Dance (bestaande uit genres als trance, techno); en 'Serieuze' muziek (zoals klassieke muziek en jazz)¹. Op het derde niveau is muziekvoorkeur geconceptualiseerd als het toebehoren aan smaakgroepen. Bij studie vier wordt uitgelegd hoe dergelijke groepen geconstrueerd zijn.

De verschillende muzieksoorten hebben verschillende gevolgen voor de symbolische omgeving waarin luisteraars zich begeven. De symbolische betekenisgeving wordt gebruikt in de verklaring van het verband tussen muziekvoorkeur en probleemgedrag. Waar de voorkeur voor bepaalde genres positief gerelateerd is aan probleemgedrag, en inhoudsanalyses van die genres aantonen dat in teksten en muziekclips datzelfde gedrag kritiekloos terugkeert, wordt de overeenkomst tussen inhoud en gedrag als verklaring gebruikt. Blijft de vraag of luisteraars met bepaalde gedragsdisposities hun muziekvoorkeur matchen met zichzelf, of dat muziekvoorkeur die gedragingen beïnvloedt, of dat beide processen verlopen.

Hieronder volgt een overzicht van de studies in dit proefschrift.

¹ Deze laatste stijl is in dit proefschrift afwisselend betiteld als 'Elite' (vanwege het positief verband houden met opleidingsniveau), Volwassen en Volwassenen georiënteerd. De betiteling wisselde per studie vanwege geïmpliceerde waarde-oordelen en het willen voorkomen daarvan.

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Studie 1 - De intra-individuele consistentie van muziekvoorkeuren

De eerste studie richt zich op de consistentie van muziekvoorkeur over tijd binnen individuen. In eerder onderzoek is wel de stabiliteit van muziekvoorkeuren gemeten over een groep van individuen, dus inter-individueel. In feite werd in die studies de stabiliteit van populariteit van verschillende genres of stijlen gemeten. In deze eerste studie wordt de consistentie van voorkeuren gemeten binnen individuen in de leeftijd van 12 tot 29 jaar. De consistentie van muziekvoorkeur wordt op drie niveaus gemeten. Eerst op stijlwaardering, vervolgens op genrewaardering en uiteindelijk op artiestwaardering. Die laatste maat laat zien dat er weinig consistentie is, alhoewel die toeneemt met de leeftijd. Genres worden redelijk consistent beoordeeld en stijlvoorkeuren zijn zeer consistent. Groepen naar geslacht en schoolniveau laten slechts kleine verschillen zien. Consistentie neemt vooral toe met de leeftijd, terwijl die ook in de jongste leeftijdsgroep van 12 tot 17 al erg hoog is. Muziekvoorkeur is dus al behoorlijk goed ontwikkeld, maar kristalliseert nog uit in de late adolescentie en vroege volwassenheid.

Studie 2 - De soundtrack van middelengebruik

Dit proefschrift heeft tot tweede doel bestaand onderzoek naar de rol van popmuziek in de ontwikkeling van adolescenten aan te vullen. Door participatie in epidemiologische onderzoeksprogramma's hebben we de steekproef uit kunnen breiden. Daardoor kan in een grote en representatieve steekproef van Nederlandse adolescenten, over een scala aan muziekgenres, bepaald worden wat de relevantie is van muziekvoorkeur voor probleemgedrag.

Canadees, Brits, Australisch en Amerikaans onderzoek had verbanden gerapporteerd tussen muziekvoorkeuren en middelengebruik van jongeren. Met name een voorkeur voor heavy metal, rap, reggae en dance werd in verband gebracht met middelengebruik. Onder Nederlandse scholieren is (in 2003) waardering voor punk/hardcore, techno/hardhouse, en reggae geassocieerd met meer gebruik, terwijl voorkeuren voor top40 en klassieke muziek samenhangen met minder middelengebruik. Voor meiden is een waardering voor house/trance een risicofactor voor roken en drinken. In vorig onderzoek waren met name voorkeuren voor rap/hiphop en heavy metal risicofactoren. Onder Nederlandse scholieren hangt een voorkeur voor rap/hiphop alleen positief samen met roken onder meiden. Heavy metal waardering hangt negatief samen met middelengebruik; namelijk met minder roken onder jongens en minder alcoholgebruik onder meiden. De specifieke muziekvoorkeuren die positief samenhangen met

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middelengebruik kunnen over tijd en tussen landen variëren. Maar over het algemeen geldt dat een voorkeur voor hardere en subversieve muziek samenhangt met meer middelengebruik, terwijl een voorkeur voor toegankelijke of volwassenen georiënteerde muziek samenhangt met minder middelengebruik.

Studie 3 - De muziek of de vrienden

De derde studie onderzoekt of een mechanisme de relatie tussen muziekvoorkeur en middelengebruik kan verklaren. In de vorige studie bleek dat het middelengebruik van vrienden erg belangrijk was in de verklaring van het eigen middelengebruik van jongeren. Het onderdrukte het verklarende belang van muziekvoorkeur zelfs enigszins. Dat betekent dat muziekvoorkeur en middelengebruik van vrienden iets gemeenschappelijk hebben. Daarom kijken we in de derde studie naar de relatie tussen muziekvoorkeur en middelengebruik, en in hoeverre deze relatie verklaard (gemedieerd) wordt door middelengebruik van vrienden. Uitgesplitst in muziekstijlen; het zou immers kunnen dat die mediërende rol van vrienden verschilt per muziekstijl.

De muziekgenres worden ingedeeld in de volgende vier stijlen (zie hoofdletters ter onderscheid): Hard (techno/hardhouse, punk/hardcore), Pop (top 40, nederpop), Urban (rap/hiphop, soul/r&b) en Volwassen (klassiek, jazz). In het geval van Hard wordt het positieve verband met middelengebruik grotendeels gemedieerd door middelengebruik van vrienden, en in het geval van Urban volledig. De muziekvoorkeuren voor Pop en Volwassen hebben een duidelijk negatief verband met eigen middelengebruik, wat ook grotendeels correleert met gebruik door vrienden. Invloed van vrienden doet zich dus bij alle muziekstijlen gelden. Deze bevindingen worden verklaard door de signalerende functie van muziekvoorkeur in het sociale verkeer. Die betreft levensstijl. Verder zijn ze te verklaren uit de rol van persoonlijke kenmerken en het proces van wederzijdse beïnvloeding van vrienden.

Studie 4 - Muziekvoorkeursgroepen en hun psychosociaal functioneren

Canadese, Australische en Amerikaanse onderzoeken rapporteerden verbanden tussen intern en extern gericht probleemgedrag van jongeren aan de ene kant en hun muziekvoorkeuren aan de andere kant. Daarbij werd de muziekvoorkeur verdeeld in mainstream versus non-mainstream. De groep met de extreme muziekvoorkeur gaf aan vaker

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probleemgedrag te vertonen. Een dergelijke dichotomie doet weinig recht aan de werkelijke verdeling van muziekvoorkeuren onder jongeren.

Om muziekvoorkeur beter te representeren stellen we met de hulp van ruim vierduizend jongeren een typologie op van het Nederlandse adolescente muziekpubliek in 2001. Zeven groepen blijken de muziekvoorkeur en -afkeur zinvol weer te geven ten aanzien van een viertal muziekstijlen. Die stijlen (weer in hoofdletters) betreffen Pop-dance (top 40, house/trance/techno, club/mellow), Urban (rap/hiphop, soul/r&b, reggae), Rock (heavy metal, punk/hardcore/grunge, gothic, rock), en Elite (klassiek, jazz). De genres die als eerste genoemd staan als voorbeeld bij de stijlen worden gebruikt om een groep te construeren die niet veel met muziek heeft. Jongeren die aangeven meer dan twee van die genres niet te kennen, worden 'weinig betrokken' genoemd. Van de 4.194 jongeren die in het onderzoek meedoen, is dat 6%. De grootste groep (32,4%) noemen we 'rockpop', omdat zij positief staan tegenover alle populaire stijlen en negatief tegenover Elite. De groep die alleen positief tegenover Rock staat en negatief tegenover de andere stijlen, noemen we 'exclusieve rockfans'. Zij vormen met 1,9% een kleine maar uitgesproken minderheid onder scholieren. Verder onderscheiden we de groepen 'middle of the road' (18,1%, alleen positief tegenover Pop-dance), 'urban' (20,2%, zeer positief tegenover Urban en redelijke positief tegenover Pop-dance), 'elitisten' (7,5%, relatief positief tegenover Elite en negatief tegenover alle populaire), en 'omnivoren' (13,9%, positief tegenover alle vier de muziekstijlen).

Van de bekende factoren die een rol spelen in probleemgedrag, blijken vooral geslacht en sociale steun van de moeder veel verschillen te verklaren in internaliserende problemen. Die komen namelijk meer voor bij meiden dan bij jongens. En jongeren die aangeven weinig sociale steun te ervaren van hun moeder, hebben hier vaker last van. Externaliserend probleemgedrag komt meer voor bij jongens en hangt sterk samen met functioneren op school. Naast deze factoren speelt het behoren bij een muziekvoorkeursgroep een vergelijkbare rol. Internaliserend probleemgedrag wordt vaker gerapporteerd door de groepen 'elitisten', 'omnivoren', 'weinig betrokken' en 'exclusieve rockfans'. Externaliserend probleemgedrag komt vaker voor onder de groepen 'urban', 'rockpop', 'exclusieve rockfans' en 'omnivoren'. De groep 'middle of the road' vertoont de minste problemen. Bij pogingen deze verbanden te verklaren, rijzen de volgende vragen: Betreft het hier een invloed van muziek? Volgt muziekvoorkeur uit

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bepaalde persoonlijke kenmerken? Of is er sprake van interactie tussen voorkeur en persoonlijke kenmerken?

Studie 5 - Een typologie van muziekgebruikers

In de laatste studie maken we een gebruikerstypologie volgens patronen van vijf vormen van muziekgebruik. Vervolgens vergelijken we de typen met elkaar, in termen van tijd gespendeerd aan luisteren, emoties tijdens luisteren en internaliserende problemen. De vijf vormen van muziekgebruik labelen we als volgt: 'goede sfeer', 'troost en afreageren', 'identificatie met artiest en teksten', 'vriendschaps criterium' en 'centraliteit van muziek'. Er blijkt een driedeling in de typologie: een eerste groep die alle vijf de vormen van muziekgebruik omarmt (19,7%, zeer betrokken), een tweede grote groep die met name muziek voor de 'goede sfeer' gebruikt en matig positief staat tegenover de andere vier vormen (74,2%, redelijk betrokken) en een derde kleine groep die muziek alleen gebruikt voor de 'goede sfeer' en verder negatief staat tegenover de andere vormen van gebruik (6,1%, weinig betrokken) .

Qua leeftijd verschillen de drie groepen niet, maar in de zeer betrokken groep zitten duidelijk meer vrouwelijke respondenten. Deze groep luistert per dag langer naar muziek dan de andere twee groepen (meer dan twee uren) en houdt meer van Urban en Dance. Van de respondenten scoren zij het hoogst op 'troost en afreageren', maar niet het hoogst op negatieve emoties tijdens luisteren. De redelijk betrokken groep heeft negatieve emoties tijdens luisteren het meest, en de weinig betrokken groep het minst. De zeer betrokken groep heeft van de drie groepen juist de meeste positieve emoties tijdens luisteren. Ook is deze groep niet vaker angstig, depressief of teruggetrokken. Degenen die muziek intensief gebruiken, blijken er meer voor- dan nadelen van te hebben.

Algemene discussie

In het laatste deel van het proefschrift worden alle bevindingen samengevat en in een gemeenschappelijk theoretisch kader geplaatst. Daarna worden beperkingen en implicaties van de studies beschreven.

De studies in dit proefschrift kunnen geen uitsluitsel geven over het causale vermogen van muziekvoorkeur. Naast causaal, is de relatie tussen muziekvoorkeur en gedrag ook te conceptualiseren als reflectief. Dat wil zeggen, de relatie komt voort uit de aansluiting die

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jongeren vinden in muziek bij hun eigen psychosociale disposities. Muziekvoorkeur reflecteert dan dus het psychosociaal functioneren van de luisteraar. Een derde optie conceptualiseert een interactief verband tussen inhoud van muziek (qua gepropageerd gedrag) en disposities.

Er kan worden geconcludeerd dat muziekvoorkeur aan het begin van de adolescentie al vorm heeft en in de late adolescentie en jongvolwassenheid uitkristalliseert. In termen van hoofdstijlen van muziek vertonen de meeste jongeren en jongvolwassenen hoge consistentie. Muziekvoorkeur is niet alleen consistent over tijd, maar ook consistent in relevantie voor het verklaren van middelengebruik en psychosociale problemen. Met name muziek die als non-mainstream gekwalificeerd wordt, is relevant voor de verklaring van probleemgedrag. Non-mainstream betreft dan zowel muziek die neigt naar het deviante, subversieve als naar het elitaire, volwassenen georiënteerde. Maar ook jongeren die niets met muziek hebben, behoren tot een non-mainstream, in die zin dat zij afwijken van de jongerencultuur. Ook zij scoren hoger op probleemgedrag (sociale problemen). De richting van de culturele afwijking van de mainstream bepaalt in elk geval de aard van de problematiek. Op de meeste jongeren en jongvolwassenen heeft muziek, ongeacht muziekvoorkeur, een positieve uitwerking. Zelfs op de groep die muziek in hoge mate gebruikt om negatieve gevoelens af te reageren. Muziek mag dan samenhangen met psychosociale problematiek, "zonder muziek zou het leven een vergissing zijn" (Friedrich Nietzsche^f).

^f Nietzsche, F. W. (1889; 1982), p. 471. *Twilight of the Idols*. In W. Kaufmann (Ed.) *The Portable Nietzsche* (pp. 463-563). New York: The Penguin Group.

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Curriculum vitae

Juul Mulder was born August 25th, 1976, in Stadskanaal, Groningen. In 1995 she obtained her pre-university degree, and went on to work for a year in different places in Europe before studying Psychology at the University in Groningen. She specialized in experimental psychology, studying such topics as semantic and music processing using electro-encephalographic measurements in ERP (event-related potential)-studies. During her studies she also conducted an experiment relating harmonic transitions to shifts in semantic context. She presented this study at the 2000 Beatles Conference of the International Association of Popular Music studies at the University of Jyväskylä, Finland. The ERP-study on music processing was conducted at the Max-Planck Institute for Cognitive Neuroscience in Leipzig, Germany. In 2001 she obtained her Master's degree in Psychology, with distinction.

After taking another two years to work in different places of Europe, trying out different work types, she returned to the academic world in May 2003, when she could embark on the PhD-project that led to this dissertation, under the main supervision of Professor Tom ter Bogt. Initially, she was working at the Amsterdam School of Communication Research (ASCoR), Department of Communication Science, University of Amsterdam. Here she followed several post-doctoral courses as part of the PhD-training (on research methodology and communication science), and presented her work on both national and international conferences. In addition, she participated in the two-weekly PhD-club *Popular culture studies* of Professor Liesbeth van Zoonen. In May 2006 she moved along with her supervisor to the Department of Interdisciplinary Social Sciences, University Utrecht, where she finished writing her thesis in June 2008. Here too, she followed methodological post-doctoral courses, presented nationally and internationally, and participated in meetings of the research group of Professor Wilma Vollebergh called *Youth in Changing Cultural Contexts*. Since May 2008 she has been working at the Research and Documentations Centre of the Ministry of Justice, the Hague.

Dankwoord

YOU'D BETTER LOSE YOURSELF IN THE MUSIC
THE MOMENT, YOU WANT IT
YOU'D BETTER NEVER LET IT GO
YOU ONLY GET ONE SHOT
DO NOT MISS THIS CHANCE TO BLOW
'CAUSE OPPORTUNITY COMES ONCE IN A LIFETIME, YOU KNOW

Het nummer Lose Yourself van Eminem (2002) was mijn oppeppende soundtrack voor het krijgen van de positie die ik zo graag wilde; het promotieonderzoek bij professor dr. Tom ter Bogt dat tot dit proefschrift heeft geleid. Dank allereerst en vooral aan jou, Tom, voor je uithoudings- en doorzettingsvermogen in het beteugelen, bijsturen en aansporen wanneer dat nodig was. Ik kon altijd bij je terecht met vragen, je nam er altijd tijd voor. Samen met mijn ook zeer gewaardeerde co-promotor, dr. Quinten Raaijmakers, vormden jullie een even gedreven als sympathiek duo. Graag wil ik ook professor dr. Liesbet van Zoonen danken voor haar steun voor dit project, voor de coaching tijdens mindere tijden en voor goede tijden met de 'Popular Culture phd-club', zowel in het Oost-Indisch Huis als bij haar thuis.

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